Bombay Geographical Society
VOL. 6
00159999

THE
ASIATIC SOCIETY OF BOMBAY
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BOMBAY

TRANSACTIONS

OF THE

BOMBAY GEOGRAPHICAL SOCIETY,

FROM SEPTEMBER 1841 TO MAY 1844.

EDITED BY THE SECRETARY.

VOLUME VI.

PRINTED FOR THE BOMBAY GEOGRAPHICAL SOCIETY.
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PREFACE.

THE reprint of this volume of the Society's Transactions is due to the liberality of one of its most esteemed members, Sorabjee Pestonjee Framjee, Esq., J.P., Bombay.

D. J. KENNELLY,
Hon. Sec.

May 1865.

PRELIMINARY OBSERVATIONS.

THE sickness and subsequent demise of the late lamented Dr HEDDLE, the first, and, till the time of his death, the indefatigable Secretary of the Society, conjoined with other causes which do not here require to be explained, have occasioned the publication of the Society's Transactions to fall nearly three years behind,—the last number, containing the Memoirs of Mr MASSON'S Journeys in Beloochistan and Affghanistan having been issued in September 1841,—the present number having been sent to press in May 1843, and published in July 1844. It has been considered expedient in the arrangement of the papers, to depart, under these circumstances, from strict chronological order, both in respect of the time at which they have been prepared for, as well as that at which they may have been received by, the Society: this departure on the present occasion, by reason of the large accumulation of matter which has taken place since the date of the last publication, permits papers on the same subject to be placed in juxtaposition with each other; while it enables the Society to bring those of pressing and immediate interest forward at an earlier date than they could have appeared had the order referred to been maintained. The three papers on Abyssinia furnish an example of what is here stated: the paper of Lieutenant SMEE, which had long lain aside, treats of topics closely allied to those which occupied the attention of the Abyssinian Mission; and though of old date, becomes once more interesting,—bearing, as it does, very closely on the Dissertation of Mr RIGBY on the Somalee language; while both help to illustrate some of the topics treated of in the paper of Captain HARRIS. Though it is not for a moment intended to be maintained that the

advantages afforded by such an accumulation as permits the better selection and arrangement of papers, at all compensate for the inconveniency incurred by the delay which occasions this, it will not be considered illegitimate, when the latter has at any rate occurred, that its concomitants be turned to the best account,—and that that which cannot be got rid of, be, as far as possible, improved upon. The unfortunate delay which has latterly taken place in passing the Transactions through the press has been occasioned, in part, by the time occupied in setting up the Tables and preparing the Diagrams for Captain Ross's Tidal Observations; in part by the sickness of the present Secretary, and the unusual load of other avocations imposed on him. It is hoped that this explanation will help to excuse the apparent negligence which has arisen in acknowledging, by corresponding gifts, the liberality of the other Associations which have sent their Transactions with so much punctuality to the Bombay Society.

The present number opens with an outline of the proceedings of the Society, taken from the Minute-Book, from February 1841 to March 1842, referring to the late Secretary. The Transactions were expected to have been published before any later meetings could have taken place: this expectation not having been realised, the minutes of the meetings down to May 1844 are printed as a portion of the preface. Dr HEDDLE died on the 6th March 1842, —a sketch of his character, taken from the *Bombay Times* of the 12th of March, is subjoined: the minutes of the special meeting, (*vide* p. 16 of the Transactions,) which was convened shortly afterwards to devise some means of placing on record the Society's estimation of his worth, will furnish the means of forming a judgment of the grounds of grief and regret which his loss afforded.

DEMISE OF ASSISTANT-SURGEON J. F. HEDDLE, DEPUTY ASSAY-MASTER.

It is with unfeigned sorrow that we announce the demise, on the 6th instant, at Mahabuleshwur, of Assistant-Surgeon J. F. Heddle, Deputy Assay-Master.

In this melancholy event, we have to mourn the loss of an officer, who, for variety and extent of scientific acquirements, has left no equal among us. Naturally of feeble constitution, Mr Heddle was unable to mix much in general society, and his many excellent qualities were, in consequence, only known to

those who enjoyed the privilege of his private friendship, or were associated with him in public duties. In addition to high proficiency in his immediate profession, Mr Heddle was possessed of extensive and well-arranged information in history, geography, chemistry, botany, geology, and other branches of natural history; but such was his singular humility, that it was only in the unguarded moments of friendly intercourse that the fulness of this knowledge was ever displayed. During the four past years Mr Heddle had filled, with marked distinction, the offices of Acting Assay-Master and Deputy Assay-Master in the Mint of this place, and during the six previous years had held, with high credit, various appointments on the Medical Staff. But it is not alone in the sphere of his public duties that the loss of this valuable officer will be felt;—every attempt that was *judiciously* and *honestly* made with the view of extending knowledge, or directing its application to useful ends, had not only his cordial support, but the devoted labour of his leisure hours. We would in proof record, that when, in the year 1831, at the instigation of the Honourable Mountstuart Elphinstone, and other gentlemen connected with the Royal Geographical Society of London, Lord Clare and Sir Charles Malcolm instituted the Geographical Society of Bombay—Mr Heddle was selected to fill the office of Secretary; and to show how far the expectations which led to this honorary selection have been realised, we need only point to the high estimation in which this Society is held, both in England and on the Continent of Europe. To the same unalloyed love of knowledge, and its application to the comfort and happiness of mankind, the Horticultural and Agricultural Society is under a deep debt of obligation. To the Medical and Physical Society also, many valuable acts of assistance and support were silently rendered. Apart from the immediate duties of his office, the loss of this officer will be severely felt by Government; for we believe that on his judgment almost exclusive reliance was placed in regard to the value of the various mineral and other natural products of this presidency. We feel, indeed, that in these few lines we have paid but a feeble tribute to the memory of one whose place amongst us it will at present be impossible to supply; but we rest in full confidence that those Societies of which he was not only a distinguished member, but the sinews and the strength, will record in their pages those numerous obligations which it was the study of this true lover of science to conceal; and that they will unite and raise some permanent and suitable monument to commemorate the worth of so loved and honoured an associate.—*Bombay Times, March* 12, 1842.

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RULES AND REGULATIONS.

1*st*, This Society, established for the purpose of encouraging and instituting Geographical researches in Western Asia, and the countries contiguous, is denominated the Bombay Geographical Society.

2*d*, The Society shall consist of Honorary and Ordinary Members.

3*d*, Every candidate for admission, whether as an Ordinary or Honorary Member, must be proposed and seconded at one Meeting of the Society, and balloted for at the next.

4*th*, No person shall be considered duly elected, unless he unite in his favour the votes of three-fourths of the Members present.

5*th*, An annual Subscription, amounting to Rs. 15, to be paid by all Members in advance, on the 1st of April of each year.

6*th*, Members may compromise, by a single payment of Rs. 100, instead of a payment of Rs. 15 annually.

7*th*, *Of the Office-Bearers and Committee.*—The Office-Bearers shall consist of a President, a Secretary, and Treasurer—permanent; three Vice-Presidents, and a General Committee of Management, (consisting of twenty Members,) to be chosen annually.

8*th*, That the Committee of Management and other Office-Bearers of the Society, eligible annually, shall be chosen by general vote of the Ordinary Members, to whom voting lists shall be forwarded three months previous to the Anniversary Meeting, at which the returns shall be scrutinised and announced.

9*th*, Two Sub-Committees, consisting of six Members each, shall be annually selected from among the Resident Members of the General Committee, at the first meeting after the annual election of the latter. The Sub-Committee having the superintendence of all the internal management, account, &c., of the Society, shall be denominated the "Sub-Committee of Accounts:" the other shall conduct the correspondence of the Society, and suggest plans for attaining its scientific objects —to be called "The Sub-Committee of Correspondence."

10*th*, The Secretary shall be a Member of the Committee of Management *ex-officio*.

11*th*, Each Sub-Committee can meet independently of the other for

the purpose of discharging the business especially intrusted to it; and the meeting shall be summoned by a circular from the Secretary.

12*th*, The Sub-Committee of Accounts shall lay before the Annual General Meeting, to be held in May or April of each year, the state of the Society's Funds. The Sub-Committee of Correspondence shall lay before the same Meeting a list of the Scientific Contributions made to the Society during the year.

13*th*, Each Sub-Committee shall elect, from among its Members, a President, to preside at its meetings.

14*th*, The President shall preside at the General Meetings of the Society, to conduct the Proceedings, and give effect to the Resolutions.

15*th*, The Vice-Presidents shall preside at the General Meetings in the absence of the President, and in rotation at Meetings of the General Committee of Management.

16*th*, The Secretary shall attend the Meetings of the Society and those of the Committee, to record their proceedings and conduct the correspondence. He shall also superintend the persons employed by the Society, and, under the control of the Committee for managing the accounts, shall superintend the expenditure of the establishment.

17*th*, The Treasurer will receive, through the Secretary, all monies due to the Society, and make payments out of the funds of the Society according to the directions of the Secretary.

18*th*, The Society shall meet on the third Thursday of every month, at 4.30 P.M.

19*th*, Notice shall be given, either at a previous Meeting or to the Secretary, of any motion or subject of discussion intended to be brought before the Meeting, at least one week beforehand; and all matters of business, &c., intended to be brought before the Society, shall be notified to the Members by printed circulars.

20*th*, Each Member may introduce a friend to all ordinary Meetings of the Society.

21*st*, The Society shall present copies of its Transactions to the principal Public Libraries in India, Europe, and America; and exchange them with Societies, and with such authors or publishers as may be disposed to bestow works of equivalent value, or nearly so, on the library of the Society.

22*d*, All Members of the Bombay Branch of the Royal Asiatic Society are entitled to be admitted Members of the Geographical Society, on making application to this effect through the Secretary, and paying the prescribed annual subscription.

LIBRARY REGULATIONS.

The following are the Rules in force for the Management of the Library :—

1. The Books of the Geographical Society's Library may be taken out by Members, subject to the following exceptions and restrictions—

2. No Book shall be delivered out by the Librarian, unless the Member requiring it shall either sign the entry in the Register, or send a receipt to him.

3. No Member shall keep any Book longer than fourteen days.

4. Any Member requiring a Book which has been delivered out, may insert, or cause to be inserted, his name in a Register kept for that purpose; and it shall be the duty of the Librarian to apply for it as soon as the period specified in the above rule has expired, and, on receipt, to forward it to the first on the list of applicants if there be more than one.

5. Not more than three volumes to be taken out at one time by any Member.

6. The Librarian shall inspect carefully every Book at the time it is returned, and, if damaged, shall report the circumstance to the Secretary.

7. Any Book lost or damaged, shall be charged to the Member in whose name it stood in the Register, at the invoice price, or such price as shall be fixed by the Committee of Management.

8. Members leaving Bombay, are required to return, before their departure, to the Library, all Books belonging to it in their possession—and no Book shall be carried out of Bombay.

9. No Map, Chart, Atlas, or Book of Reference, shall be taken out, without express permission from the Committee of Management, except Books of Reference, (for forty-eight hours,) on the order of the Secretary to that effect.

10. Any Member may propose Books, Charts, Maps, or Atlases, to be added to the Library, by inserting their names in a Register kept for that purpose, and they will be ordered or not as the Committee may deem expedient.

11. Every new Work, Map, Chart, &c., shall lie on the table one month before it is taken out.

BOMBAY GEOGRAPHICAL SOCIETY.

(ESTABLISHED IN 1832.)

OFFICE-BEARERS, 1864.

Patron.

His Excellency the Honourable Sir HENRY BARTLE E. FRERE, K.C.B., Governor of Bombay.

President.

The Honourable W. E. Frere, F.R.G.S.

Vice-Presidents.

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BLACK, THOMAS.
MANSFIELD, His Excellency Lieutenant-General Sir W. R., K.C.B.

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BIRDWOOD, G. C. M., Esq., M.D.
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FLETCHER, Rev. W. K., M.A.
GRANT, Sir A., Bart., M.A.
HAINES, R., Esq., M.D.
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KENNELLY, D. J., F.R.A.S., Corrs. F.R.G.S.

Treasurers.

REMINGTON & Co.

Clerk.

BALRANT KRISHNARAS PALEKAR.

MEETINGS

OF THE

BOMBAY GEOGRAPHICAL SOCIETY.

The Quarterly Meeting of this Society was held in the Library Room, Town-Hall, on Thusday the 4th August 1842.

Colonel T. Dickinson, *Vice-President*, in the Chair;—
Present.—Dr J. Glen; Dr J. Burnes, K.H.; Dr C. Morehead; Dr R. Brown; Lieut. W. S. Suart; and G. Buist, Esq., Secretary.

The Minutes of the last anniversary meeting, held on the 5th May 1842, having been read and approved of, Dr Morehead, on the part of the special committee for providing a Memorial to the late Dr Heddle, reported that the sum subscribed, and which was now paid up and deposited in the hands of the treasurers, Messrs Remington and Co., amounted to Rs. 2735. Drawings had been obtained from London for the guidance of the Society: but though the funds at the disposal of the committee appeared amply sufficient for the objects in view, there were none of the plans before them which quite met their approval. In a former return of the amount subscribed by the members of the Royal Geographical Society, together with those of the Agri-Horticultural Society of Western India, a private subscription had been inadvertently included. This amounted to Rs. 210, and was set down by gentlemen not entitled to subscribe to the principal fund. The explanation was necessary to account for a discrepancy in the returns. Further arrangements were left with the special committee. The following donations and letters were then laid before the meeting:—

Paper.—Narrative of a journey from Kilat to Sonmeeanee, via Nal, the Baran Luk and Ootul, by Lieut. G. H. Robertson, 25th Regt. Bombay N. I. (Presented by the Author.)

Books.—Annual Report of the Transactions of the Bombay Chamber of Commerce, for the official year 1840–41; with a letter dated 9th May 1842. (Presented by the Chamber of Commerce.)—Jackson's (J.R.) What to observe—and the Journal of the Royal Geographical Society of London, vol. xi., part 1, of 1841, with a letter dated London, 11th January 1842. (Presented by J. R. Jackson, Esq., Secretary to the Royal Geographical Society of London.) Annual Report of the official year ending 30th April 1841.

Maps.—A Map of the Bombay Presidency, by Major A. C. Peat, Superintendent of Roads; with a letter dated 28th June 1842. (Presented by Government.) Map of Affghanistan, with a letter dated 21st June 1842. (Presented by Government.)

Letter from Bombay Asiatic Society to Bombay Geographical Society concerning the Ores presented to the Musuem, dated 14th May 1842. Letter from Captain G. L. Jacob, with some Geographical information, dated Kattewar, 1st June 1842.

Chronological Records of the British Royal and Commercial Navy, from the earliest period (A.D. 1827) to the present time, (1842,) founded on official Documents, &c., by Cæsar Moreau, Esq., F.R.S., French Vice-Consul in London &c., presented by Manockjee Cursetjee, Esq., with a letter dated 2d August 1842.

On the motion of Dr Burnes, K.H., seconded by Colonel Dickinson, Cæsar Moreau, Esq., F.R.S., French Vice-Consul in London, was elected an honorary

member of the Society. The names of several gentlemen were set down for election; but as none of the members present were acquainted with them, or had been asked either to move or second their nomination, their election was deferred. It was stated to be considered neither respectful to the Society nor to the candidates for membership, that the party desiring to have them proposed should not think it worth while either to appear in person, or make arrangements with other members to undertake the generally very agreeable duty of proposing and seconding the election of new members. The large Map of Affghanistan was shown fitted up on cloth with rollers, varnished, &c. The picture of Sir Charles Malcolm belonging to the Society, was still in the hands of Mr Gwaikin, who had kindly undertaken to repair the damage sustained by it when shipwrecked on board the *Bentinck* in June 1840. The Secretary reported that there were now a sufficiency of papers selected for publication from the large collection in the hands of the Society, to complete four numbers of Transactions. This would bring them up to the present time. The publication of these papers having fallen a twelvemonth behind, and there seemed to be no reason to fear but that, if publication was gone on with, an abundant supply of papers of value would flow in upon them to permit the regular quarterly issue of the Transactions to be proceeded with as formerly. Such was the state of the Bombay printing-offices at present, that the cheapest and most expeditious mode of getting the papers through the press appeared to be by sending the MSS. home, and having the completed books returned. The Agricultural Society had this experiment now on trial—the copy for several numbers of their Transactions having been sent home on the 19th June. The subject having been very fully discussed, it was resolved that Rs. 700 should be placed at the disposal of the Secretary, for the purpose of having the Transactions printed at home with as little delay as possible. The chairman pointed out an omission which had taken place in returning thanks to the gentlemen whose donations had been laid before the Society last February; and to whom the customary acknowledgments had not been made. It having been explained that this omission occurred in consequence of the sickness of the late lamented Secretary, Dr Heddle, and the absence of the usual office writer, the Secretary was directed to have the defect remedied by writing to the gentlemen in question, thanking them for their favours, and explaining the reason of the previous oversight. No other business appearing before the Society, the meeting adjourned to the first Thursday of November.

A Special Meeting of this Society was held in the Society's Room, Town-Hall, on Thursday the 18th August 1842.

The promotions consequent on the death of Sir Alex. Burnes having appeared in the Government *Gazette*, a special meeting of this body took place on Thursday, called by requisition of the Vice-Presidents—Colonel Dickinson, Engineers; and Captain R. Oliver, R.N. The following gentlemen were present:—Colonel Dickinson; Captain Oliver; Colonel Melvill, Secretary to Government; Dr Kennedy; Dr M'Lennan; Dr Glen; Dr Brown; Lieutenant Montriou, I.N.; Lieutenant Grieve, I.N.; Lieutenant H. Barr; and G. Buist, Esq. Captain Ross, the President of the Society, being at present in the Deccan, Colonel Dickinson was called to the Chair. The following requisition, explaining the objects of the meeting, was read:—

To George Buist, Esq., *Secretary*.

Bombay, 13*th August* 1842.

Sir,—It having been unanimously agreed to at the anniversary meeting of the Society that was held on the 5th of May last, that as soon as the official intimation was received of the death of Sir Alexander Burnes, a special meeting should be convened for taking into consideration the best method of manifesting the

Society's respect for his memory, we beg to propose, in the absence of the President, that a special meeting be held for that purpose in the Society's room, on Thursday the 18th instant, at three o'clock P.M.

We have the honour to be, Sir, you most obedient servants,

ROB. OLIVER.
T. DICKINSON.

GENTLEMEN,—In compliance with the above, I have to request that you will assemble for the purpose notified by the Vice-presidents, in the room of the Society, at three o'clock P.M., on Thursday the 18th instant.

GEO. BUIST, *Secretary.*

Colonel DICKINSON said—The announcement of the circumstances connected with the death of Sir Alexander Burnes has been so overpowering, and demanded such peculiar sympathies, that our minds can hardly be said to have yet received sufficient composure to permit a calm view being taken of the national loss which has been sustained in the removal of that most enterprising and observant of modern travellers, and accomplished and promising of our Indian statesmen. Now, however, something ought to be, and I have no doubt will be, done, to mark the sense of the public loss which has been sustained by that event; more especially at the Presidency which has the honour of claiming him as one of its officers, and of having trained him for the conspicuous services to which he was called: and when it is added, in reference to the more immediate object for which we are this day assembled, that it was among the claims of that distinguished individual to such commemoration, that no one had more energetically co-operated with our ever-to-be lamented secretary, the late Dr Heddle, towards the formation of this Society, or more assiduously laboured, *non solum per se sed magno opere alios*, for the attainment of all those objects to which our endeavours have for the last twelve years been directed, it cannot, I would respectfully submit, be denied that it peculiarly belongs to such an institution to take the initiative in doing honour to the memory of one who has done so much in furtherance of our views, and for the advancement of geographical discovery. With these few observations, by which I fear very inadequate justice is done to the merits of our late illustrious colleague, alas! no more, I proceed to move, in accordance with the resolution which was unanimously passed at our last anniversary meeting:—

"That, in testimony of the services rendered by the late Lieut.-Col. Sir Alexander Burnes, C.B., to the Geographical Society of Bombay,—to the establishment and reputation of which he had so essentially contributed, not less by his bright example inciting others on whom his personal or political influence extended, than by his valuable communications with which the earlier numbers of our Journal abound;—and in admiration of the noble spirit of enterprise which, from the dawn to the close of his public life, pre-eminently marked his career, and obtained for him the highest distinction which it was in the power of the present Society to confer—

"That a portrait of this distinguished member of the Society be procured, to adorn the committee's room.

"That a committee be appointed to carry into effect the resolutions of the meeting.

"That a copy of these resolutions be forwarded to the Secretary for the information of the Parent Society."

The motion was seconded by Captain Oliver.

Dr KENNEDY expressed his entire concurrence in the general principle of a debt being due by the Society to a distinguished member of its body, but he was most anxious that it should be most clearly and most explicitly shown to be purely a private acknowledgment by the Society, in its individual capacity, and not as in any manner representing the public of India, or even of Bombay. He had been asked this morning by natives who had wished to attend, whether it were a public meeting in the Town-Hall; and they had expressed disappointment at its not being so, and that parties not members of the Society could not with propriety

take a share in the proceedings. He considered that the debt of gratitude which was due to the memory of Sir Alexander Burnes was a great national obligation, and he felt satisfied that it would be honourably discharged by the United Services in India, and by the Crown and Parliament of Great Britain at home; nor did he at all doubt but that we should see the statue of Burnes not only in the Town-Hall of Bombay, but in St Paul's Cathedral. No one paused now to consider the eminence of Sir Alexander Burnes as a mere geographical explorer; the important position he had held in the eyes of all Asia and of all Europe having entirely overshadowed the minor excellencies of what he (Dr Kennedy) from the most intimate personal knowledge would venture to call his almost perfect private and public character. It was true that the Society was met to consider him only in that view, and in their exclusive position had no call to consider him in any other—but was this friendship? was this enough from a Bombay community to the memory of the most distinguished public servant that Bombay had produced in this century—one who was second to none in the gigantic operations in which he moved, and who, when he fell, left no second—who while he lived was the head and the heart of every local British interest, and the anchor of every British hope in Affghanistan—whom assassination therefore selected as its first victim, and, as the miserable result showed, had judiciously so selected; for neither head nor heart nor hope seemed ever for a moment to have been recognised after his fall? The history of those melancholy transactions had only reached us in shreds; but he had in his hand extracts from letters from one of the prisoners now in the custody of Ukhbar Khan, in which it was stated in so many words that, with Sir Alexander Burnes, fell all, and that with one blow, and in one moment, they appeared at once to have sunk from being the terror of the whole Affghan nation, to be the laughing-stock of the rabble of Cabool. Dr Kennedy alluded generally to the Parliamentary discussion and the charges imputed to the Government of Lord Auckland and the India Board of Sir John Hobhouse, of having garbled the despatches, and of having given a different tone from the original intention of the writer, to Sir Alexander Burnes's letters, by artful arrangement. Whatever had passed, he would venture to say, from the closest intimacy, that the stainless integrity of private character, and distinguished eminence of official fitness on the most trying emergencies, would only be the more apparent and the more satisfactorily proved by the publication of Sir Alexander Burnes's papers, whenever circumstances permitted their production. He was altogether contented to go with the proposition before the Society, but wished that the most definite distinction should be drawn to mark it as the act of the Geographical Society of Bombay to mark its friendly regard for a distinguished member.—A few verbal alterations were made in the original proposition to meet Dr Kennedy's suggestion, which was unanimously concurred in by the meeting.

After some other remarks explanatory as to the objects of Colonel Dickinson's resolution—that the Society desired to offer a tribute to the memory of Sir Alex. Burnes as a member of their body, and that the views of Dr Kennedy, though concurred in, did not affect this much of their proceedings—the motion of Colonel Dickinson was carried by acclamation. It was unanimously agreed to—that a portrait of Sir Alexander be provided from the funds of the Society, to be hung up in their room in memory of their illustrious late brother member;—and a committee, consisting of Colonel Dickinson, Dr Glen, and the Secretary, was appointed to carry these resolutions into effect. Colonel Dickinson, convener—the committee to report progress next ordinary meeting. It was explained, that besides the picture by M'Lise in the costume of Bokhara, in the possession of John Murray, Albemarle Street,—there was understood to be a portrait of Sir A. Burnes, painted by W. Brockaden, F.R.S., of the Royal Academy, in Somerset House; and that a copy of it if possible, or of any other that may be considered better, in the possession of Sir Alexander's family, be obtained.

Mr Buist stated that it would be some consolation to the friends of Sir A. Burnes to know, that no indignity appeared to have been offered either to the corpse of that lamented officer or that of his brother, as had been the case with

others; and that they were both decently interred the second night after the massacre, by a highly respectable Kuzzilbash, whose name, Shurreef Khan, ought to be known. The Kuzzilbash was *Naib* in the treasury of Captain Johnson, formerly paymaster but now a prisoner at Cabool; who had in the most considerate manner communicated the circumstance within these two days to Dr Burnes.

The special business of the meeting having been concluded, the following members were admitted:

Sir Erskine Perry—proposed by General Barr, seconded by Captain Oliver, R.N.

Lieut. Boulderson, I.N.—Proposed by Lieut. Montriou, I.N., seconded by Col. Dickinson.

Lieut. Archd. M'Donald, I.N.—Proposed by Lieut. Montriou, seconded by Capt. Oliver.

Assist.-Surgeon Thomson, 11th N.I.—Proposed by Lieut. Montriou, seconded by Dr Kennedy.

It was also proposed by the chairman, and unanimously agreed to, that J. R. Jackson, Esq., Secretary to the Royal Geographical Society, to whom the Society's thanks had been accorded for a copy of his recent very interesting work, than which we could not name a more useful *vade mecum* for even the scientific traveller, be appointed an honorary member of the Society.

The Secretary stated that it was this season proposed to publish *in extenso*, in the Bombay Almanac, the regulations of all the societies, together with lists of their members; and that as the regulations and lists of this Society stood in need of revision, it would be be well to avail themselves of the present opportunity of having this attended to. It might be well also to have 100 copies or so of these thrown off in a separate pamphlet for the use of members. The proposal was approved of, and the Secretary authorised to take steps accordingly.

It was resolved that a copy of the Minutes of these proceedings be transmitted to the parent Society in London.—The meeting then adjourned.

The Ordinary Quarterly Meeting of this Society was held in their Room, Town-Hall, on Thursday the 10th November 1842, *at* 2 *o'clock, and was rather thinly attended.*

Capt. D. Ross, I.N., F.R.S., *President*, in the Chair;—

Present.—Col. T. Dickinson; Dr R. H. Kennedy; Dr F. Sheppee; the Rev. Dr Wilson; Dr J. Burnes, K.H.; Dr C. Morehead; Dr J. G. Malcomson; and Dr G. Buist, Secretary.

The Minutes of last general meeting held on the 4th August, and of the special meeting of the 18th, for the purpose of taking measures to provide for the rooms of the Society a portrait of the late Sir A. Burnes, were read and approved of. Dr Morehead reported, in reference to the memorial for the late Dr Heddle, that the committee had written a second time to London for further plans and drawings, as none of those originally sent gave satisfaction: they were now awaiting an answer, the funds having been realised and deposited with the treasurers. The committee appointed on the 18th of August for providing a portrait of Sir Alexander Burnes, reported that they had written to London by the mail which left on the 27th of that month, but could not look for a reply earlier than the 10th December. The requisite funds were in progress of realisation. J. R. Hadow, Esq., was proposed by Dr Morehead, seconded by Dr Buist, and admitted as a member of the Society. The following donations were then laid on the table of the Society:—

By Government.—*Paper*, Lieut. Macpherson's Report upon the Khonds of the districts of Ganjam and Cuttack; with a letter, No. 2043, dated 2d August 1842.

1. *Maps.*—Sketch of the road between Sion and Trombay.
2. *Ditto.*—Showing the present state of the road from Panwell to Oorun.

3. *Map.*—Showing the present state of the road from Nagotna to Penn.
4. *Ditto.*—Showing the present state of the road from Chowk to Kullian, and from Moorar to Shapoor.
5. *Ditto.*—Of the road from Chandore to Nassick.
6. *Ditto.*—Of the proposed line of road from Tannah to Panwell, (3 maps.)
7. *Ditto.*—Of the road between Belgaum and Vingorlah.
8. *Plan* of the new line of road to Kulladghee.
9. *Ditto.*—Of the road from Kulladghee to Bagulkote.
10. Tracing from Lieut. Curtis's plan of the road between Poonah and Sholapoor.
11. Sketch of the road from Belgaum to Dharwar.
12. Survey of the Dawk route between Panwell and Vingorla.
13. Map showing the proposed line of road between Bhewndy and Surat; with a letter, No. 3731, dated 24th October 1842.

By Asiatic Society.—*Books.*—Journal of the Bombay Branch Royal Asiatic Society, for January 1842. Edited by the Secretary. No. 3.

By Paris Asiatic Society.—Bulletin de la Société de Géographie, deuxieme serie. Tome xvi.

By Parent Society.—Journal of the Royal Geographical Society of London, vol. ii., part second, 1841.

Journal Asiatique; ou, Recueil de Mémoires, etc.; tome 12 (2 copies) and tome 13 (4 copies) of different months.

Letters.—Note from Monockjee Cursetjee, Esq., dated Musjeed Bunder, 19th October last; with an enclosed letter of thanks from Jacob Graberg, of Hemso', dated Florence, 15th August 1842.

The thanks of the Society were ordered to be returned to Government for their numerous and valuable contributions. The Secretary reported, in reference to the printing of the Transactions of the Society, that he had taken the liberty of detaining the manuscript for the back copies of the Journal which he had, on the 4th of August, been authorised to transmit to Europe for publication, in consequence of the arrival of ten Scotch compositors for the *Bombay Times* establishment. It was hoped that if they could not yet promise to have the work either more quickly or economically executed here than by sending it home, and having it returned overland, that the advantage of reading the proof-sheets would be secured. The Agricultural Society had received an answer to their proposal for printing their Transactions in Edinburgh, to the effect that the work which cost Rs. 260 in Bombay, would be executed in Edinburgh for less then £12. For carriage overland, at the rate of 4s. a pound weight, an equal sum was demanded; so that printing which would, until the recent importation of Scotch compositors, have occupied six months, and cost Rs. 260, could be executed at home and returned overland in three months, costing, all charges included, Rs. 240. —The meeting adjourned.

The Bombay Geographical Society met on Wednesday the 8th February 1843, *at* 3 *o'clock* P.M., *in the Society's Room, Town-Hall.*

Lieut.-Colonel T. Dickinson, *Vice-President*, in the Chair;—

Present—The Rev. Mr Fletcher; Dr Kennedy, Physician-General; Dr Burnes, K.H.; Dr Bird; Dr Brown; Dr Morehead; Mr Henderson, Professor; and Dr Buist, Secretary.

There was little business of any importance before the Society. A letter from Sir C. Malcolm to Mr Skinner, reminding the Society of its early connexion with that of London, and intimating that the latter felt disappointed that no copies of the Bombay Transactions had been sent to them, was read. The Secretary intimated that, in returning thanks to Lieut.-Colonel Jackson, the Secretary of the London Society, for the copy of his work entitled "What to Observe," the desired series,

in so far as procurable, had been forwarded: the Secretary's letter, though not as yet acknowledged directly, was mentioned in the *Athenæum* as amongst the communications received. A letter, to similar effect as that of Sir C. Malcolm, had been received from Mr Ayrton, London, in reference to the Geographical and Asiatic Societies of Paris: this had only reached the Secretary's hands within a few hours of the despatch of the last mail, and could not therefore be replied to at length; but one set of copies of the Transactions had been sent, and another, with a letter of explanation, was about to be forwarded next month. In reply to a remark of Dr Burnes's, that the Bombay Geographical Society ought to forward copies of its Transactions to the leading public Libraries and learned Associations in Europe which were likely to set a value on them,—it was explained, that when the Transactions were originally published, no more copies were thrown off than were required by the members,—that these were now out of print,—and that, though subsequently a large surplus impression was put to press, the requisite despatches had not been made. This matter was directed to be carefully attended to in future; a list of parties to whom the Society's publications were sent, to be drawn up and laid before the committee for enlargement or correction. The following donations were then presented:—

By Government.—1. Copy of a letter from S. B. Haines, Esq., Political Agent at Aden, to J. P. Willoughby, Esq., Secretary to the Government of Bombay, No. 29, dated 29th September last, and a fac-simile of the inscription taken from a stone recently discovered at that place.

By the Author.—2. Printed Paper.—Lumley's *Bibliographical Advertiser*, dated London, Thursday, October 27, 1842.

By B. B. R. Asiatic Society.—3. [2 Books] 1. Premier Voyage à la Recherche des Sources du Bahr-el-Abiad ou Nil-blanc, &c., &c. 2. Accroissement de la Collection Géographique de la Bibliothèque Royale en 1841.

The Aden inscription had been lithographed by the Egyptian Society at Cairo. The inscription was merely that of a funeral monument with the names of the parties to whom, and by whom, it was erected. Letters from Mr Burnes, Montrose, were received, of dates 27th October and 30th November, in reply to that of the Secretary, of date 26th August, in reference to the picture of the late Sir Alex. Burnes. From these it appeared that all diligence had been used in making preparations to obtain the desired portrait. The Royal Geographical Society of London had been applied to, and gave consent for having the painting by Brockaden, in their rooms, made use of for a copy. Mr Brockaden, the distinguished artist by whom it was originally executed, had kindly agreed to paint this; and, to assist him, a picture by Mr Scott had been forwarded from Montrose, and Dr D. Burnes, of London, had promised to superintend the finishing of the work. The thanks of the Society were directed to be returned to these gentlemen for the great trouble they had taken to forward the views of the Society. As it was expected that letters might be received by the mail hourly looked for, intimating the completion of the portrait, outstanding subscriptions were directed to be called for without delay.

The following gentlemen were then elected members of the Society:—

1. Commander J. P. Sanders, I.N., proposed by Col. Dickinson, and seconded by Dr Burnes.

2. Lieutenant J. Barker, I.N., proposed by Dr Burnes, and seconded by Col. Dickinson.

3. Commander H. B. Lynch, I.N., proposed by Dr J. Burnes, and seconded by Dr. G. Buist.

4. Lieutenant C. P. Rigby, 16th Regiment, N.I., Aden, proposed by Dr G. Buist, Secretary, and seconded by Dr Burnes.

5. Captain George d'Arcy, Aide-de-Camp to the Honourable the Governor Purrell, proposed by Dr J. Burnes, K.H., and seconded by the Rev. Mr Fletcher.

6. Henry Cormack, Esq., proposed by Colonel Dickinson, and seconded by Dr Morehead.—The meeting then adjourned.

Proceedings of a Meeting of the Committee for erecting a Monument to the Memory of the late Dr Heddle, held on the 23d March 1843.

Present.—Lieutenant Suart, Dr Buist, and Dr Morehead.

1st.—Considered the Subscription List, showing a total of Rs. 2790.

2d.—Considered a statement of the estimated cost of erecting an Obelisk over the grave of the late Dr Heddle, at Mahabuleshwur, amounting to Rs. 300.

Resolved.—That as the Fund subscribed by Dr Heddle's private friends for the above object amounts to Rs. 210, the deficiency be made up by transferring Rs. 90 from the Society's fund.

3d.—Considered various plans of Monuments, &c., obtained from London through the kindness of Lieutenant Suart.

Resolved.—That as none of the plans are approved, being either too expensive, or in other respects unsuitable, Lieutenant Suart be requested to adopt such measures as seem to him expedient for having the Monument executed without further delay—at a cost not exceeding (packing charges included) Rs. 2000. That the balance, Rs. 700, be reserved to defray Cathedral fees, fixing the Monument, or any other contingent charges which it may be necessary to defray.

4th.—*Resolved.*—That the following inscription be adopted for the Monument:—

TO THE

MEMORY

OF

JOHN FRASER HEDDLE,

Of the Bombay Medical Establishment—Deputy Assay-Master of the Mint of Bombay,

SECRETARY

TO THE

Geographical Society of Bombay, and to the Agri-Horticultural Society of Western India.

Born in the year 1806, 8th January, and who died on the 6th March 1842:

THIS MONUMENT

IS ERECTED

BY

The Members of the Geographical and Agri-Horticultural Societies,

In testimony of their admiration of his extensive and varied acquirements, high-minded integrity, chastened judgment, and sincere humility; and of their just and grateful appreciation of the unaffected and persevering devotion with which his rare endowments were applied to extend Geographical science; and to increase the capabilities of this country, and thereby contribute to the comfort and happiness of its people.

The Meeting adjourned.

The Annual General Meeting of this Society took place in their Room, Town-Hall, on the afternoon of Thursday the 4th May 1843, *at* 3 *o'clock.*

Colonel T. Dickinson, *Vice-President*, in the Chair;—

Present.—Dr C. Morehead; Dr J. Bird; Dr J. G. Malcolmson, F.R.S.; Dr J. Burnes, K.H., F.R.S.; and the Secretary, G. Buist, Esq., LL.D.

The Minutes of last meeting having been read, it was stated that no advices had since then been received of the despatch of the Picture of the late Sir A.

Burnes, which, from former letters, was supposed likely to be by this time on its way to India. Information to this effect might be looked for by next steamer. A considerable number of subscriptions were still outstanding, which the Secretary was directed to collect without delay.—The Minutes of the proceedings of the Committee on the Memorial to Dr Heddle were read. It appeared that none of the plans or drawings of monuments which had been received from London were such as to meet the views of the Committee, who had, in consequence of this, and to obviate further delay, written home such instructions as would enable the sculptor to proceed with the work, the cost of which was restricted to 2000 Rs. A subscription which had been entered into by a few of the friends of Dr Heddle, not members of either of the societies with which he was connected, and not therefore entitled to contribute to the general fund, for erecting an obelisk near the place of his interment on the Mahabuleshwur Hills, amounted to 210 Rs., and the Committee, finding that 300 Rs. would be necessary for this purpose, had diverted 100 Rs. from the general fund, leaving a balance in hand for the erection of the monument in the Cathedral or at Byculla Church.—The following gentlemen were admitted Members of the Society:—Captain E. Arthur, H.M. 4th Regiment, and Military Secretary to the Honourable the Governor of Bombay, proposed by Dr J. Burnes, K.H., F.R.S., and seconded by Dr J. Bird; Lieutenant J. S. Aked, of the 4th Rifles, Baroda, proposed by Dr J. Burnes, K.H., F.R.S., and seconded by Colonel Dickinson.

The following Office-Bearers, on scrutiny of the signed lists, were declared duly elected for the year 1843–44:—

Three Vice-Presidents.—Captain R. Oliver, R.N.; J. P. Willoughby, Esq.; Colonel T. Dickinson. *Twelve Resident Members.*—Captain E. P. Del Hoste; Dr C. Morehead; Dr R. Brown; J. G. Malcolmson, Esq., M.D., F.R.S.; Lieutenant-Colonel N. Campbell; Lieutenant-Colonel P. M. Melvill; Rev. G. Pigott; Dr J. Burnes, K.H., F.R.S.; J. Bowman, Esq.; Dr J. M'Lennan; Commander H. B. Lynch, I.N.; Ball Gungadhur Shastree, Esq. *Eight Non-Resident Members.*—Captain W. C. Harris; Dr J. Bird; Major H. C. Rawlinson; Lieutenant H. A. Orsmby, I.N., F.R.S.; Major J. Holland; Major R. Leech; Captain R. Shortrede; Captain G. Le G. Jacob.

The following Donations were laid on the table of the Society, and thanks ordered to be returned to the respective donors:—

By the Paris Society.—Bulletin de la Société de Géographie, deuxième série; vols. xvi. and xvii.

By the Asiatic Society.—1. Journal of the Bombay Branch of the Royal Asiatic Society, edited by the Secretary. No. iv., April 1842.

By the Author, through Manockjee Cursetjee, Esq.—1. Degli Ultimi Progressi della Geografia Sunto Presentato dal Conte Cavalliere Jacope Graberg da Hemso, &c. &c.

By the Author, through Bengal Society.—1. On Whirlwinds and Storms; with Replies to the Objections and Strictures of Dr Hare. By W. C. Redfield, Esq., 1842.

By the Rev. G. Pigott.—1. The Present State of Egypt, or a New Relation of a late Voyage into that Kingdom, performed in the years 1672 and 1673. By F. Vansleb, R.D.

The accounts of the year having been presented, it appeared that there was a sum of Rs. 3,328-9-2 to the credit of the Society in the Treasurer's books. Colonel Dickinson, in felicitating them on the prosperous state of their funds, stated that he did not think that excess of wealth was expedient, and that they could not do better than devote a portion of this ample balance to the reprinting of the earlier numbers of their Transactions. These were replete with very valuable matter, and had now for a long time been entirely out of print. He therefore proposed that a sum, not for the present exceeding Rs. 1000, should be allotted for this purpose. This was unanimously approved of and agreed to. The printed Transactions of the Society now occupy about 1500 pages of letterpress; of these there are two numbers got up under charge of Major Jervis, and one number

containing the papers of Mr Masson,—still a considerable supply of copies on hand. The others, to the extent of above 800 pages, are almost entirely exhausted. A reprint of them would form two very valuable volumes. Originally, no more were printed than served for the supply of members. It had, at a former meeting, been resolved that as many should be thrown off as would supply public libraries and learned societies in all parts of the world, to such extent as was deemed expedient, leaving a few copies on hand for sale. There were at present four numbers in the printer's hands, which would be issued in rapid succession, and would afford from 200 to 300 pages of letterpress, costing about Rs. 700. The first of them might now very speedily be looked for; a considerable portion of it being in type.

A valuable paper, by Dr Winchester, giving a minute topographical and statistical account of the lately acquired territories around Hydrabad, was laid before the meeting, and directed to be circulated; Dr Winchester to receive the thanks of the Society.

The consideration of an application from Cairo for assistance from the Society to Mr Bell, a traveller of great spirit and enterprise, who was about to start for Abyssinia, in the hope of discovering the sources of the White Nile, was postponed till the Society should be better informed on the subject. Some very interesting observations were made by Colonel Dickinson on a map of the Arabian Coast, just completed by him, and handed up to Government. It was remarked as being singular and unfortunate, that for hundreds of miles together along some of the shores in the line of the cruises of our ships, we had for hundreds and hundreds of years obtained no accession to our knowledge.

The meeting was more thinly attended than it usually is, many of the members requiring to attend the funeral of Dr Moffat.—The meeting adjourned.

The Quarterly Meeting of this Society took place in their Room, Town-Hall, on the afternoon of Thursday the 3d August 1843, *at* 3 *o'clock.*

Colonel T. Dickinson, *Vice-President,* in the Chair;—

Present.—Dr J. M'Lennan; Dr C. Morehead; Rev. G. Pigott; Manockjee Cursetjee, Esq.; Captain E. P. Del Hoste; Dr J. G. Malcolmson; Ball Gungadhur Shastree, Esq.; Commander H. B. Lynch, I.N.; T. Cardwell, Esq.; and G. Buist, Esq., Secretary.

The Minutes of last general meeting having been read, the Secretary stated, in reference to the picture of Sir Alexander Burnes and monument to Dr Heddle, that matters were in the same state as previously reported—the committees having done all that was required of them, now only waited for the arrival of advices of shipment from home. Attention having been called to that portion of the minutes referring to the printing of the earlier transactions, some discussion took place as to whether papers of old date, and which seemed worthy of publication, but from some unexplained cause had been formerly set aside, should now be added to the new issue of the earlier numbers of the transactions. It was argued that this was only carrying out what appeared originally to have been the Society's intention, some papers being marked "to be continued," the continuation not being given, and some illustrations which were referred to in others being altogether awanting. One question was, whether these defects ought not in a reprint to be supplied, or whether they were to adhere to the original so closely as to copy imperfections and all. It was, after several explanations, agreed that, in the special cases named by the Secretary, the deficiencies might be supplied, but that, as a general principle, no additional matter should be included in reprints beyond what was contained in the original. Such was the custom in other societies; it was ungracious to alter the arrangements of predecessors, who had agreed to set certain papers aside when the whole facts connected with the subject were before them, and who, at the time, had doubtless good and sufficient reasons for what they did,

though these were not now known to the Society. Should it be considered expedient now to publish papers which had formerly been excluded, let this be done in a separate form along with the other Transactions, the dates at which they came into the Society's hands being noted, so as to prevent mistakes; they ought not to be placed amongst the originally printed issues. The opinion of the meeting appearing to be in favour of this latter view, it was unanimously agreed to be adopted, the above being laid down as a general principle: any individual cases of difficulty were to be decided on their own intrinsic merits by the general committee—the publication to proceed under direction of the Secretary where none such made its appearance. Two other special points, to which the attention of the committee had been drawn by the Secretary's circular, were dropped. It was not considered necessary that a special sub-committee on publication should be appointed, the general committee being sufficiently at hand for reference. The following donations, received since last meeting, were laid on the table of the Society:—

BOOKS.

By the Author.—Printed Extracts from "Musings in Egypt and other countries." By Major W. Stirling.

By Dr J. W. Winchester.—I. Testimonies to the Fertility of Ancient Palestine, &c. 1. The Judaic Law, as opposed to the English Poor Law. 1. Some account of the Life and Writings of Maimonides, the celebrated "Egyptian Moses;" and of the origin of the Judaic Code. 1. The laws of the Hebrews, relating to the Poor and the Stranger. 1. A Series of Woodcuts, in illustration of the Scenery, Customs, and Antiquities of Ancient Palestine, &c.

By Chamber of Commerce.—Report of the Bombay Chamber of Commerce for the Third Quarter of 1842-43.

By Royal Geographical Society of London.—The Journal of the Royal Geographical Society of London, vol. xii., part 1. of 1842; with a Letter dated 3 Waterloo Place, London, 11th November 1842, from Lieut.-Col. J. R. Jackson, Secretary to the above Society.

By the Société de la Asiatique de Paris (through the Royal Geographical Society of London).—1. Réponse à l'Examen Critique de M. Stanislas Julien, inséré dans le Numero de Mai 1841 du Journal Asiatique. Par M. G. Pauthier. 2. Journal Asiatique; ou, Recueil de Mémoires d'Extraits et de Notices Relatifs à l'Histoire, à la Philosophie, aux Langues et à la Litteratures des Peuples orientaux, &c.; tome 13. 2. Ditto; tome 14. 1. Exercises pratiques d'Analyse de Syntaxe et de Lexigraphie Chinoise, &c. &c. Par Stanislas Julien. 1. Vindiciae Sinicae. Derniére Réponse à M. Stanislas Julien, &c. &c. Par. G. Pauthier.

By Dr G. Buist.—Buist on Field Gates.

By the Medical Board, under the sanction of Government.—1. Report on the Medical Topography and Statistics of the Presidency Division of the Madras Army, &c. 1. Report on the Medical Topography and Statistics of the Centre Division of the Madras Army; with a Letter dated 17th June 1843, from Dr J. Burnes, K.H., Secretary to the above Board.

By the Medical Board, with the sanction of Government.—3. Transactions of the Medical and Physical Society of Bombay, Nos. 3, 4, and 5. 1. A Practical Memoir on the History and Treatment of the Diseases of the Camel, &c., by Assistant Surgeon W. Gilchrist, public cattle depôt of Madras Establishment. 1. O'Shaughnessy's (Dr W. K.) Bengal Dispensatory. 1. Annesley's (Dr J.) Researches into the Causes, Nature, and Treatment of the more prevalent diseases of India, and of warm climates generally. 1. Report on the Epidemic Cholera, as it has appeared in the territories subject to the Presidency of Fort St George or Madras, 1824; with a letter dated 15th June 1843, from the Secretary to the above Board.

PAPERS.

By Government.—1. Remarks on the north-east coast of Africa, and various tribes by which it is inhabited, by Lieutenant C. P. Rigby, 16th Regt. N.I.,

with a letter dated 30th May last, from Lieut.-Colonel Melvill, Secretary to Government.

By the Author.—1. Note on the practicability of advancing an Army from Europe into Asia by the provinces of the Euphrates and Tigris, by Dr J. W. Winchester—with a letter dated Rutnagherry, 1st June 1843.

By the Author.—1. Captain E. P. Del Hoste's paper on the Route from Dessa to Sukkur, with topographical observations on the Desert, being the direction or line of march performed by the 6th Regt. N.I. in 1840.

MAPS.

By Dr George Buist.—1. Map of comparative Readings of eight Barometers. 1. Rough plan of the Battle of Meeanee—surveyed by Captain Jacob.

LETTERS.

By the Royal Geographial Society.—1. Letter dated 3 Waterloo Place, London, 15th Dec. 1842, from Lieut.-Colonel J. R. Jackson, Secretary to the above Society, regarding Lieut.-Colonel Sir A. Burnes's Portrait, and thanks to this Society. 1. Letter dated 12 Gloucester Road, Old Brompton, 6th May 1843, from W. Weir, Esq., soliciting this Society's proceedings to be printed by some respectable house in England, and will undertake to see the volumes through the press, &c.

By Lieut. W. Christopher, I.N., through Lieut. W. C. Montriou, I.N.—One Pelican, and one Baboon.

The thanks of the Society were desired to be returned to the respective donors. The specimens meant for the Museum were directed to be handed over to the Royal Asiatic Society. In reference to a letter from Sir Charles Malcolm, mentioned by Colonel Dickinson, it was stated that the valuable suggestions therein contained had nearly all been anticipated, or were in process of being carried into effect. Two letters had been received from Lieut.-Colonel Jackson, Secretary to the London Society—one of the 11th November, and the other 15th December, both brought by the Cape and in the inverse order of their dates. The Secretary stated that these had been replied to by return of post. Copies of the new issues of the Transactions would be forwarded to the London, Paris, and other societies, so soon as they were published: the causes of the apparent remissness on these points had been formerly explained. A letter was read from Mr Weir, editor of the *Colonial Gazette* and of the London Geographical Society's Transactions, kindly tendering his services to correct the press should it still be the Society's purpose to print at home. Mr Weir was thanked for his obliging offer, of which, however, advantage could not be taken, as the printing was now in progress at Bombay. In reference to this, it was stated that the American Mission Press were proceeding rapidly with the reprint, and had nearly got as far as the two hundredth page, and that in a few weeks more the first number would be issued. The new matter was in the hands of the printers of the *Bombay Times:* it was in MS., and in consequence its progress was more tardy: they were well on to the hundredth page, and being now for the present free of the laborious occupation which had recently engaged them, would get on much more rapidly than hitherto, so that of this issue a number would, in the course of a couple of months or so, be published. It was chiefly occupied with papers on the geography of the north-western part of Africa, betwixt the Line and 14 deg. N.; and with that of Scinde, in reference to which a very large amount of new and striking information had been placed in the hands of the Society—now rendered doubly interesting to us from the position we occupied in that country—so little anticipated when the bulk of the papers were written. A strong hope was expressed that no delay which could possibly be avoided would be permitted to occur in getting the whole of the papers referred to published, while public anxiety was particularly alive to the importance of information on such subjects.

It was stated by the Secretary, that a large collection of minerals, which had lain in the cabinet of the Society from the time the resolution had been passed to transfer their collection to the Museum of the Asiatic Society, had apparently fallen aside at the period of Dr Heddle's sickness; it was not altogether certain

whether some of them might not belong to private collections, though for nearly two years no one appeared to have inquired after them. They were directed to be made over to the Asiatic Society for the use of their Museum,—the Secretary undertaking to keep them by themselves in case they should be claimed.

The Society resolved that some valuable cases of mountain-rock specimens originally furnished by Dr Morehead, should be retained; their former minute being now modified and rescinded to this extent. The specimens had been arranged and named by Professor Jamieson of Edinburgh; they were just such as were on very many occasions most convenient and desirable for reference, and as such of much value to the members, and the Asiatic Society was already plentifully provided.

A map of the Fullalee, near Hydrabad, with a plan of the battle-ground and arrangements of the troops, was laid before the Society by the Secretary; it had been drawn from a survey by Captain Jacob, and given to him (the Secretary) for a different purpose, but was much too valuable for mere newspaper publication now that the matter was over, and the public disposed to rest satisfied with the sketches they had already seen, however imperfect. It was resolved, that should the accuracy of this be duly authenticated, it should be published in the Transactions so soon as a description to accompany and explain the map could be procured from Hydrabad; it was also determined that Government should be applied to for a drawing of the battle-ground of the 17th February, to be published along with the others as important portions of military geography, provided a similar memoir explanatory of this could be procured. There seemed to be no doubt entertained, considering the well-known scientific acquirements of many of the officers in the Hydrabad army, that the documents would readily be obtained so soon as the wishes of the Society were made known.

Mr Malcolmson, Secretary to the Bombay Branch of the Royal Asiatic Society, stated, in reference to a portion of the geological collection formerly made over to the Museum, that in the work of Mr C. Darwin, on the structure and distribution of coral reefs, lately published, constant reference was made to the information, verbal or written, supplied by Captain Moresby. In fact, nearly the whole of the speculations on the Atolls of the Maldives, and the great Chagos bank, is stated by the author to have been derived from an excellent MS. account of the Chagos Islands, the published charts and valuable verbal information of that officer. The collection of specimens from these interesting localities, presented by Captain Moresby to the Society, had now been classed and arranged in the Asiatic Society's Museum. In some instances the descriptions accompanying them had been destroyed or lost, and those to which this mischance had befallen were kept by themselves. As a collection, they were invaluable—perhaps matchless, considering how plentiful and perfect they were, and the very great interest which recent researches as to the characteristics of coral reefs had conferred on them. It was well that this should be known, that gentlemen might be aware that their contributions were not lost sight of or undervalued. Dr Buist explained at some length a set of tracings of barometric curves presented to the Society, the result of an elaborate experiment with a large number of instruments, of which, in the course of twenty-four consecutive hours, successive readings were simultaneously taken every half hour. A paper on this subject had been prepared for another Society, within whose province it more peculiarly lay.

The Secretary then made a general statement of the condition of the affairs of the Society: their funds were highly flourishing, though on them the large amount of printing now in progress would draw heavily: they had no reason to complain of the neglect of other learned bodies, or of the want of contributions from their own members, as the pile of donations on the table would testify: they were rapidly bringing up their leeway in publication, so that their labours should not be forgotten by the world, and were every month increasing the amount of their members: these were all as gratifying symptoms of continued success as could be desired.

The following extracts were read from the Address of the President of the

Royal Geographical Society of London, delivered at the anniversary meeting of May 1842, published in part i., vol. xii. of the Transactions just received :—

"DEATHS OF DISTINGUISHED GEOGRAPHERS.

"The early and violent death of one of our most distinguished members, Sir Alexander Burnes, who fell a victim by assassination in the outbreak at Cabool early in November last, has occupied so many fears, and has been a subject of such universal regret, that I should not be justified in dwelling upon this event longer than it may be necessary to add the expressions of sorrow felt for the loss by the Royal Geographical Society; a body which was amongst the first to stamp upon Burnes's career in the pursuit of science the most solid mark of approbation in their power to bestow. It is now eight years since this valued and lamented officer received the royal premium in these rooms from the hands of the present Master-General of the Ordnance, then your president. This proof of your admiration for his talents, and of your confidence in what those talents were further capable of bringing about, was bestowed for the ardour, zeal, ability, and judgment evinced by Sir Alexander Burnes in conducting the first European expedition which had ever encountered the stream of the Indus from its mouth to its source, and also for the exemplification of the same high qualities during his journey from the banks of the Indus through Cabool, across the Hindu Koosh, by Balk and the Transoxania, to Bokhara, and into Persia. During a life of unremitted activity and most valuable services to the East India Company, Sir Alexander Burnes was a second time employed to ascend the Indus: on this occasion the river was more accurately surveyed by Lieutenant Wood, and a work, which may be said to be a posthumous publication, has recently appeared, which has added very materially to our knowledge of the countries adjacent to that river, and which will add to the fame of an officer whom all his countrymen in the east and the west had hoped would long have been spared to us for the completion of still more important labours."

"Geography has likewise experienced a very severe loss in the untimely death of Dr Lord, the companion of Burnes and of Wood, who had done most valuable service in the course of their navigation up the Indus, and who was killed at Purwan, in the last action of our troops with Dost Mohammed, on the 2d of November 1840. Sir Alexander Burnes, in his 'Cabool,' gives two of Dr Lord's letters from Khoondooz, dated December 1837, which, as he says, cannot be read without deep interest, and with a melancholy regret at the death of their energetic and accomplished writer. I shall hereafter have occasion to mention the circumstances under which the cause of Geography has lost one of its most ardent followers in the person of Dr Forbes, who had just completed a tour of observation amongst the countries watered by the Helmund, in the west of Affghanistan."

"The Bombay Geographical Society, one of our earliest affiliations, have had to deplore the loss of Dr Heddle, their late Secretary, who filled also the same office in the Horticultural Society of that Presidency: this gentleman had made himself eminently useful in the organisation and general proceedings of both these establishments; and their members have come eagerly forward on the occasion to testify their conviction of the superior acquirements, enlightened views, and unwearied exertions, which Dr Heddle had always evinced in guiding and co-operating with their endeavours to extend the boundaries of geographical knowledge, and to call forth the agricultural and commercial resources of India. As geographers we are bound more particularly to lament the loss of Dr Heddle, who was always ready to give instructions to any one who expressed a wish to contribute papers on geographical subjects for the meetings of the Society."

"GEOGRAPHICAL DISCOVERY IN THE EAST.

"*Euphrates.*—On the subject of the expedition fitted out in 1836, under the command of Colonel Chesney, to ascertain the practicability of navigating the Euphrates, I have the pleasure to state to you that, after that officer's return in

1837, three steam vessels were prepared by the East India Company, and sent out in frame to Basrah, where the *Nimrod, Nitocris,* and *Assyria* were put together under the directions of Captain Lynch of the Indian Navy, whose force, including the steamer left by Colonel Chesney, was thus increased to four vessels, with an adequate establishment of officers and men. After several voyages up and down the Tigris, with mails and despatches, Lieutenant Charles Campbell, of the Indian Navy, who was in command during Captain Lynch's absence from bad health, commenced the ascent of the Euphrates with two of the vessels. The *Nimrod,* Lieutenant Jones, and the *Nitocris,* Lieutenant Grounds, left Bagdad the first week in April 1841, and on the 31st of May both vessels safely reached Balis, the ancient river-port of Aleppo, forty-five miles from that city, which being the nearest point to the Mediterranean, (110 miles,) had been fixed upon during the previous expedition as the most desirable starting point. The distance thus accomplished by Lieutenant Campbell was 1130 miles from the sea, and the time occupied was 273 hours, or 19½ days. The two vessels steamed through the Lamlum marshes, and upwards, passing in succession Hillah, Babylon, Hit, El U's Hadisa, 'Ana, the river Khabur, Deir, Rakka, and Thapsacus, on to Balis, without any casualty whatever. Tamarisk was cut for fuel as required, by the Arabs, who proved to be as friendly on this as on all preceding occasions. The chief difficulties encountered were from the strength of the current, caused by different parapet walls constructed in the river to raise the water for the purpose of irrigation, but which might be partially or wholly removed at certain places, so as to make the navigation as well suited for commercial purposes as it is elsewhere. Captain Lynch found the vessels at Balis, and is now engaged on a survey of the lower part of the river. Colonel Chesney's Geographical and Historical Account of the countries bordering upon the river Euphrates, is now going through the press. It will contain 148 illustrations of the scenery of the East, and thirteen sheet maps showing the course of the Euphrates and Tigris, in addition to some of the countries eastward and westward of these 'bordering streams.'"

"*Persia.*—Mr Layard has forwarded to us a paper, in which he reports his success in reaching and examining with some minuteness the Bachtiari Mountains. He crossed the highest part of the great chain Mongasht, and, having reached Cala Tul, proceeded to Manjanic, where he did not find the mounds mentioned by Major Rawlinson, but ruins similar to those of other Sassanian cities. He describes the Abi Laid, which flows through these ruins, as uniting with a much larger stream, the Abi Allah having its source near the Kala Allah. In the neighbouring mountains there are cuneiform inscriptions, and the plain of Mel Amir contains ruins of two descriptions: that is, Sassanian ruins, and the ancient mound. The Shekafli-Salman of Major Rawlinson is to the west of Mel Amir, and not on the road to Susan. Mr Layard copied a cuneiform inscription of a tablet adjoining the natural cave, it being the only one of four that was not completely effaced. The valley of Karan is separated from the plain of Mel Amir by a high ridge of hills. At Susan there are scarcely any remains which would indicate the cite of a large city. The tomb of Daniel is a modern building of rough stones, but held in great veneration. The Karoon is here a fine broad stream, remarkable throughout the country for the excellent quality of its water. Mr Layard heard of another Susan in the mountains to the N.E. of the place he visited, and which is called, for distinction's sake, Susan-sir-Aub."

On the motion of Dr Morehead, seconded by Dr M'Lennan, Mr J. R. Remington was unanimously elected a member of the Society. The meeting then adjourned. A large number of the most regular attendants of the Society's meetings are at present absent on court-martial duty at Poonah.

The Ordinary Quarterly Meeting of this Society took place in their Room, Town Hall, on Thursday the 2d November 1843, *at* 3 *o'clock* P.M.

J. P. Willoughby, Esq., *Vice-President*, in the Chair;—

Present.—Dr J. Burnes, K.H.; Dr J. Bird; Lieut. G. Jenkins, I.N.; Lieut. C. P. Rigby, 16th Regiment N.I.

Captain Sir R. Oliver came in after the meeting was constituted. The Minutes of the last meeting having been read, it was stated that the picture of Sir A. Burnes was expected by the ship *Malabar* in the course of a fortnight or three weeks. The money already expended in defraying the cost of painting, the price of the frame, &c., amounted to £75, equivalent to Rs. 827 : 9 : 5, with freight, setting up, &c., to a total of Rs. 853 : 12. The total sum already collected amounted to Rs. 849—that is, to within Rs. 412 of the sum expended. It was stated that there were twenty-five members who had declined making payment on the plea that the subscription had been resolved on without their concurrence or sanction, while there were others who had taken no notice of the letter addressed to them on the subject. As it did not appear that the Society could insist on contributions further than what were provided for by the regulations, or agreed to by individual members, the Secretary was directed to proceed no further in the matter, but to place the names of the parties on record who had, or had not, subscribed.

The following, accordingly, is a list of the names of the gentlemen who have already paid their subscriptions:—

Captain D. Ross, I.N., F.R.S.	Rs. 10	Brought forward, .	Rs. 310
Captain Sir R. Oliver, R.N.	— 10	T. Lancaster, Esq. .	— 10
J. P. Willoughby, Esq. .	— 10	R. L. Leckie, Esq. .	— 10
Colonel T. Dickinson, .	— 10	Manockjee Cursetjee, Esq.	— 10
Dr C. Morehead, .	— 10	Dr J. M'Lennan, . .	— 10
Dr J. Burnes, K.H., F.R.S.	— 10	John M'Leod, Esq. .	— 10
Dr R. Brown, . .	— 10	Lieut.-Colonel P. M. Melvill,	— 10
J. G. Malcolmson, Esq., M.D., F.R.S. . .	— 10	Lieut. W. C. Montriou, I.N.	— 10
Lieut.-Col. N. Campbell,	— 10	E. C. Morgan, Esq. .	— 10
Captain E. P. Del Hoste,	— 10	Lieut. A. M'Donald, I.N.	— 10
Dr R. H. Kennedy, .	— 10	The Hon. Sir E. Perry, Kt.	— 10
Dr J. Glen, . .	— 10	Rev. G. Pigott, . .	— 10
Dr J. M'Adam, . .	— 10	L. R. Reid, Esq. .	— 10
Ball Gungadhur Shastree, Esq.	— 10	Dr P. B. Rooke, . .	— 10
Lieut. J. Barker, I.N. .	— 10	J. A. Shaw, Esq. . .	— 10
Major-General D. Barr, .	— 10	Captain W. S. Suart, .	— 10
Lieut. H. Barr, . . .	— 10	John Vaupell, Esq. .	— 10
W. Baxter, Esq. .	— 10	Major H. C. Rawlinson, .	— 10
J. Bowman, Esq. .	— 10	Captain W. C. Harris, .	— 10
George Buist, Esq., LL.D.	— 10	Colonel C. Ovans, .	— 10
Lieut. H. C. Boulderson, I.N.	— 10	Dr J. Bird, . .	— 10
Lord Bishop of Bombay, .	— 10	Major J. Holland, .	— 10
H. Cormack, Esq. .	— 10	Captain G. Le G. Jacob, .	— 10
R. W. Crawford, Esq. .	— 10	W. S. Boyd, Esq. .	— 10
H. Fawcett, Esq. .	— 10	Dr John Drever, . .	— 10
Rev. W. K. Fletcher, .	— 10	Lieut. E. B. Eastwick, .	— 10
H. G. Gordon, Esq. .	— 10	Captain R. Ethersey, I.N.	— 10
J. R. Hadow, Esq. .	— 10	Lieut. W. E. Evans .	— 10
W. H. Harrison, Esq. .	— 10	Captain G. Fulljames, .	— 10
W. Howard, Esq. .	— 10	Dr J. Howison, .	— 10
W. Henderson, Esq. .	— 10	Dr C. Lush, . .	— 10
		Major G. P. Le Messurier,	— 10
Carry forward, .	Rs. 310	Carry forward, .	Rs. 620

Brought forward,	Rs. 620	Brought forward,	Rs. 739
W. A. Montriou, Esq.	— 10	Command. J. P. Saunders, I.N.	— 10
Lieut.-Colonel G. Moore,	— 10	J. M. Davies, Esq.	— 10
Lieut. G. B. Mumbee,	— 10	Lieut. C. P. Rigby,	— 10
B. A. R. Nicholson, Esq., M.D.	— 10	A. N. Shaw, Esq.	— 10
Major J. R. Ousley,	— 9	Dr D. Clark,	— 10
R. K. Pringle, Esq.	— 10	John Harrison, Esq., I.N.	— 10
Dr John Scott,	— 10	H. Borradaile, C.S.	— 10
P. Stewart, Esq.	— 10	Lieut. G. Wingate, Bombay Engineers,	— 10
Dr M. Thomson,	— 10	Capt. R. St John.	— 10
Dr J. W. Winchester,	— 10	Commander H. B. Lynch, I.N.	— 10
T. Cardwell, Esq.	— 10	Lieut. J. C. Cruttenden, I.N.	— 10
J. R. Remington, Esq.	— 10		
Carry forward,	Rs. 739		Rs. 849

The following gentlemen had refused to make payment, on the score of non-liability, and for other reasons assigned :—

W. R. Morris, Esq., Account.-General. | Colonel Sir H. Pottinger, Bart.

The following had omitted to answer the letter forwarded to them, or excuse themselves for delaying payment :—

Captain F. J. Arthur.	Capt. R. Shortrede.
George Giberne, Esq.	Lieut. W. Christopher, I.N.
Capt. Geo. D'Arcy, A.D.C.	Dr C. F. Collier.
Capt. R. Coghan, I.N.	Lieut.-Col. O. Felix.
Major-General Vans Kennedy.	Major R. Leech.
Lieut. G. Jenkins, I.N.	Dr T. M'Kenzie.
John Skinner, Esq.	Lieut. A. Nash.
J. J. Waterston, Esq., N.I., I.N.	H. B. Riddell, Esq.
Lieut. J. S. Aked.	P. Scott, Esq.

The following members, being in Europe or absent from India, had not been applied to :—

Lieut. J. S. Grieve, I.N.	Lieut. J. G. Forbes.
Lieut. H. A. Ormsby, I.N., F.R.S.	Lieut. G. H. Robertson.
Lieut. W. J. Eastwick.	

It having been reported that the *Mission Press* had got so far as the 386th page in printing the out-of-print issues of the Transactions, and the *Times Press* was beyond the 200th page, and that both would, in a few months, be ready for publication, it was moved by Mr Willoughby, and seconded by Dr Bird—

Proposed, "That the reprint of the Society's Transactions be presented to the principal libraries of Europe and Asia, and to such other leading literary institutions as may apply for them."

It having been intimated that the Vice-presidentship of the Society was about to become vacant by the departure of Colonel Dickinson from the Presidency, the following resolution was moved by Sir R. Oliver, seconded by Mr Willoughby, and carried unanimously :—

"That the Society express their great regret at the departure for Europe of their Vice-president, Colonel Dickinson, and resolve to record a vote of thanks to him for the zeal and interest he has invariably evinced in promoting the objects of the institution."

The Secretary was directed to forward an extract of the meeting to Colonel Dickinson.

The following donations were then laid on the table of the Society, for which the Secretary was directed to convey their thanks to the donors respectively :—

Books.—*By Colonel T. Dickinson.*—Murray's Works of Cornelius Tacitus, in 4 vols.—Bloomfield's General View of the World, Geographical, Historical, and

Philosophical, on a plan entirely new, in 2 vols.—Orme's History of the Military Transactions of the British Nation in Hindoostan, &c., in 4 vols.—Carr's Northern Summer; or Travels round the Baltic, through Denmark, Sweden, Russia, Prussia, and part of Germany, in 1804—Mackenzie's Voyages from Montreal on the River St Lawrence, through the Continent of North America to the Frozen and Pacific Oceans, in the years 1789 and 1793—Masson's Narrative of various Journeys in Beloochistan, Affghanistan, and the Punjaub, &c., in 3 vols.—Buchanan's Sketches of the History, Manners, and Customs of the North American Indians—A Complete View of the Chinese Empire, exhibited in a Geographical Description of the Country, a Dissertation on its Antiquity, and a Genuine and Copious Account of Earl Macartney's Embassy from the King of Great Britain to the Emperor of China—Patrick's Christophori Cellarii Smalcaldensis Geographia Antiqua, &c.—Proceedings of the Association for Promoting the Discovery of the Interior Parts of Africa, in 2 vols., with three Plates. With a Letter dated 2d October 1843.

By the Rev. Geo. Pigott.—Narrative of the Surveying Voyages of Her Majesty's Ships *Adventure* and *Beagle*, between the years 1826 and 1836, describing their examination of the southern shores of South America, and the *Beagle's* Circumnavigation of the Globe, with an Appendix, under the command of Captains King and Fitzroy, R.N., and by Dr Darwin, in 4 vols., with 8 Plates—Hawkins's Germany; the Spirit of her History, Literature, Social Condition, and National Economy; illustrated by reference to her Physical, Moral, and Political Statistics, and by comparison with other countries. With a Note dated 21st October 1843.

By the Chamber of Commerce.—Report of the Bombay Chamber of Commerce for the Fourth Quarter of 1842-43.

MAPS.—*By Major T. B. Jervis, through Col. T. Dickinson.*—Map of the Island of Bombay, reduced from the original survey undertaken by order of Government by Captain T. Dickinson, with the assistance of Captain Remon, Lieutenants Jopp and Tate, of the Corps of Engineers, in the years 1812-16 (in triplicate)—Map of the Khanat of Bokhara, and a portion of the Kirghiz Steppes, prepared by Colonel Baron Meyendorff, &c. With a Letter dated 2d October 1843, from Colonel T. Dickinson.

PAPER.—*By Government.*—Memoir, in three parts, of the River Euphrates, drawn up by Commander H. B. Lynch, of the Indian Navy, while in command of the Euphrates Flotilla. With a Letter from L. R. Reid, Esq., Chief Secretary to Government, dated 14th September 1843.

Two Letters from Brevet-Captain F. Ayrton, at Paris, dated 15th August and 2d September last, respecting the interchange of the Society's publications for those of the Société Asiatique de Géographique de Paris, annexing also a Copy of his Letter to M. D'Avezac on that subject.

The Memoir of Captain Lynch was not accompanied by any map or chart, though such was constantly referred to in the paper itself; and it was resolved that Government should be applied to on the subject. It was not quite clear whether it might not be supposed to embody some political information which it might be considered inexpedient to publish; but, if so, the application of the Society could only be refused at worst. It was suggested that, in such applications, Government should be made aware that the intention of the Society was to give publicity to the documents desired. It appeared, indeed, that this assumption was always acted on, as the papers of the Society were accessible to all the members, even when unprinted: any one might make copies for himself, so that they could never be responsible for the safe custody of any really secret document. It was stated that in case Government might, from the amount of work constantly in the hands of their own draughtsman, have any objection to make a copy of the map, the Society would most cheerfully undertake this for themselves, guaranteeing the safety of the original. In reference to a suggestion made that the Institution should add to its library some expensive works about to be published by subscription, it was stated that it had on several former occasions been very emphatically laid down, though not recorded in the form of a resolution, that while the Society found its funds ample and abundant for the purpose of printing

its Transactions, and engraving charts and maps, that they would go a very short way in the establishment of a library of general literature, which was, besides, wholly unnecessary, from the accessibility and excellency of the Asiatic Society's Library. They had already made extensive purchases of geographical works, and been favoured with numerous donations; and in so far as a collection of books could be made, free of cost, it would be most carefully attended to; but no further expenditure in the purchase of books than was considered indispensable was contemplated at present. The same principle applied to the purchase of instruments, on which considerable sums had originally been laid out, as well as in contributions made to assist the researches of travellers. The whole money at their disposal could effect so little in this way, and was so liable to misapplication, that it was considered better to restrict expenditure to objects by which the purposes and efficiency of the Society could be immediately promoted—such as publication. This was not meant to be enforced with stringency or rigour, or to be considered exempt from all exceptions, but was laid down as a general principle of action. Capt. F. Ayrton was directed to receive the special thanks of the Society for his kindness and attention to their instructions—the Secretary to explain very fully the various matters adverted to in his letters.

To Geo. Buist, Esq., Sec. to the B. G. S.

3 Garden Court, Temple,
Tuesday, 15th August 1843.

My dear Sir,—I had the pleasure to receive, on the 9th instant, your letter of the 19th of June in reply to mine of last November, and advising me of the despatch of two sets of such numbers of the Bombay Geographical Society's Journal as were in print, for the purpose of being forwarded to the Société Asiatique and Société Géographique of Paris. These parcels of the Journal I have received safely by the respective gentlemen to whom they were intrusted, and I will take them with me to their ultimate destination at Paris, whither I depart to-morrow evening to remain a month or more. I am sorry that your note does not leave me in a larger capacity than the mere channel of these journals, though, under other circumstances, I should not aspire to be more; but if you will consult the Records of the Society I think you will find—at least I think you should find—a journal notice of correspondence on the subject of the exchange of papers between the Bombay Geographical Society and the Paris Société Asiatique, the object of which, I think, would have been better matured by a communication direct from one society to the other. These communications expressing approbation of the proposition should have been mutual, as I apprehend the tenor of my letter, dated, I think, from Aden, October 1840, will bear me out in suggesting. If the Société Asiatique has omitted to write, that is not exculpatory of your omission; but I am not sure that they did omit this attention, since I think Mr Mobel mentioned to me having writen to Bombay, and heard nothing more of the matter until I spoke to him. In presenting the papers I will make all necessary excuse, and take upon myself to say that Heddle's death, &c. &c.

Monsieur le Secrétaire de la Société de la Géographie de Bombay will write to vindicate the good will and intentions of this Society at an early period, which period I pray may be by the return steamer. If directed to me I will forward the letter.

You will allow me to suppose the above remarks repeated in favour of the Société Géographique de Paris, who, I think, you will in common agree with me, are also entitled to a journal communication from yourself in behalf of the Society. You must recollect that M. D'Avezac informed me that he himself had written to the Secretary of the Bombay Geographical Society, some time back, to make the proposition of an exchange of publications, without having been so fortunate as to produce the least fruit from his letter, or even learning on what spot it ultimately fell. I think, however, without any great informality, you may assume the will for the deed, and write to reconcile all past discrepancies. Hoping you will excuse this hurried letter.—Believe me, yours truly,

(Signed) F. Ayrton.

PARIS, HOTEL DE FRANCE,
R. ST THO. DE BOURSE, *Sept.* 2, 1843.

MY DEAR SIR,—On the other side is a letter I addressed to M. D'Avezac, on the 30th August, to accompany the publications transmitted through me for the Geographical Society of Paris.

Since writing it some eclaircissemens have transpired, which, though not so full as to render further explanation upon its subject unnecessary, are yet such as I freely confess it was some fault in me not to have been aware of before committing the letter to its destination. Nevertheless, I hope the Bombay Geographical Society will approve of my intention, and confirm the sentiments I have ventured to advance, particularly on their behalf, by redeeming their professions, at the earliest opportunity, through yourself. M. D'Avezac communicated my letter, together with an assurance of the friendly feeling with which the two societies desired to co-operate, to the Geographical Society at Paris, at the *séance* held last evening, (Sept. 1.) The Journals were laid on the table, and all due acknowledgments directed to be recorded. In looking over these very Journals, and comparing them with other numbers already in possession of the Society, what should come to light in the number of the Journal of the Bombay Geographical Society for 1836 but the identical letter printed *verbatim*, of the fate of which, to that instant, M. D'Avezac—who, recollect, addressed the B. G. S. in behalf of his Society—had remained ignorant. 2dly, At p. 8 of the miscellaneous matter published by the Bombay Geographical Society, in 1843, under the title of "Regulations of the Geographical Society of Western India," (a transition in dignity I presume the Society to have made from its original more humble affinity to Bombay,) is a distinct acknowledgment of M. D'Avezac's said letter, and the gratification with which the Bombay Society accede to the proposition.

Afterwards, at p. 13, come the names of several members of the Paris Geographical Society as having been elected honorary members of the Geographical Society of Bombay: among these names is that of D'Avezac himself; but no intimation that I am aware of had ever reached Paris of the honourable affiliation the Bombay Society had conferred upon these gentlemen until that evening. There is the text: I leave you to supply the commentary, which, I hope, will be so gracious as to make all eventually glad at the opportunity which gave rise to it. Really a distinct intimation should pass on all these points, and people interested should not only know what it is, but how and why it is. I know that Heddle's idea was, that the Bombay Society should work its course modestly, with as little noise as possible, trusting to its own merit for reputation; but we must remember also that reputation reacts upon merit, and, if the Society wishes to operate with influence upon its members, it must take the initiative in its own concerns, and, placing itself in the ranks of fame with other bodies, of similar constitution, trust to its own energy to vindicate its position. The one course may have been more amiable, but the other is more with the world, and not less useful, and so let the next post show the Society's affairs in the same order, and discover them mindful of all those little points in which the very vitality of their existence, extraneous to the mere labours of printing and publishing, lies.

In conclusion, M. D'Avezac requested me to ask, in behalf of himself, for copies of such of the numbers of your Journal as he has not—and which are denoted in the accompanying list (2): he also desires to be informed exactly of the numbers of the Paris Geographical Society's Journal received by the Bombay Geographical Society: I presume that omissions may be supplied. The subjoined list (1) will show what numbers of your Journal the Paris Society have and require.

No. 1.—Contents of Geographical Society's (Copy) Rules (12mo.) of 1836.

Proceedings of a Meeting held 10th March 1836.		
Do.	do.	July 1836. Memoirs.
Do.	do.	January 1837.
Do.	do.	3d August 1837.

Papers enumerated from No. 1 to No. 75, and from 87 to 91.
Wants from 77 to 86, and all others above 91.
Contents of M. D'Avezac's copy. No. 2 Rules. 1836.
Proceedings, January 1837; 3d August 1837; and Papers enumerated from Nos. 1 to 21, and from 30 to 37. *Wants* all others.

When sending the foregoing I hope the Society will allow you to enclose a complete copy for myself—many of the late numbers I have never received. The earlier which I had I gave to the Seychelles Literary Institution, with which a connexion was proposed by me, in a letter dated September or October 1839. You will also, I hope, recollect what I said last month about the Société Asiatique de Paris never having enjoyed the honour of your correspondence. If you desire *éclat*, you must at least give it.—In haste, yours truly,

(Signed) FREDERICK AYRTON.

Copy of a Letter from F. Ayrton, Esq., to Monsieur D'Avezac, Joint Secretary to the Geographical Society at Paris. Dated Paris, August 30, 1843.

MY DEAR M. D'AVEZAC,—I have received, a short time before my arrival in Paris, a packet of publications from the Bombay Geographical Society, to be presented to the Geographical Society of Paris, which I have the pleasure to forward to you for that purpose.

I also beg to avail myself of this opportunity to state, for the information of the Geographical Society of Paris, that having made a conversation, which passed at one of its sittings in July 1842, regarding a communication which had been previously sent by yourself on behalf of the Society to the Secretary to the Geographical Society of Bombay, having for its object an exchange of publications of the two Societies, the subject of a second communication from myself to the Bombay Society, I am in hopes that all necessary explanations from the Bombay Society will shortly be transmitted by its Secretary to yourself.

The apparent delay that has hitherto occurred since the receipt of my letter by the Bombay Geographical Society, must, I fear, be attributed to the misfortune of that Society's having lost, a short time previously, its late lamented Secretary, Dr J. F. Heddle, whose successful abilities, had his life been spared, would have contributed in no ordinary degree to the advancement of geographical science, to which he was particularly attached. It was no easy matter to supply the loss sustained by the Society in Dr Heddle. The present Secretary is Mr Buist, who, in his note to me accompanying the publications I have sent, acknowledges the receipt of the two vols. of the Journal of the Geographical Society of Paris intrusted to my care to be forwarded to Bombay, and adds, that my note had, with other papers of the Society, been overlooked up to the date of his writing—the 19th June last—and with reference, I presume, to your former letter, that no one was more careful than Dr Heddle of answering all letters and discharging every other part of his duties. We are therefore only doing the Bombay Geographical Society justice, in the anticipation that their future labours will have a sufficiently retrospective effect.

Mr Buist says, with reference to the publications of the Bombay Geographical Society generally :—

"We have at present a reprint of the earlier numbers of our transactions passing through the press simultaneously with a large impression of unpublished papers. The two will make three or four numbers full of novel and interesting matter.

"The old copies were not forwarded to you, as we had none of them on hand."

In laying the substance of your note before the Society, I was desired to express their thanks to you for your most obliging offer, and to say how happy they

would be to avail themselves of your services. Copies will hereafter be regularly forwarded to you.

I enclose Mr Buist's note, from which the above extracts are made, if you choose to refer to it.—Yours truly,

(Signed) FREDK. AYRTON,
M. de la S. de G. de Paris.

P.S.—I have not yet sent the Journals for the Société Asiatique, not having seen M. Mohl, the Joint Secretary, but I will do so in a day or two and let you know. In the meantime, I must write them something similar to the letter above. (Signed) F. A.

On the motion of Lieutenant G. Jenkins, I.N., seconded by Captain Sir R. Oliver, R.N., Mr John Harrison, Assistant Storekeeper, I.N., was unanimously elected a member of the Society. The meeting then adjourned.

A Quarterly Meeting of this Society took place at the Town-Hall, in their Room, on Thursday the 8th February 1844, at 3 o'clock P.M.

Dr James Burnes, K.H., F.R.S., *Member*, in the Chair;—

Present.—Dr. J. G. Malcolmson, F.R.S.; and Dr G. Buist, Secretary to the Society.

The Minutes of the last Meeting having been read and approved—

The following donations were presented to the Society:—

Books.—*By the Author through Manockjee Cursetjee, Esq.*,—Ultimi Progressi della Geografia Sunto, &c., da Jacopo Graberg da Hemso,—with a note dated Musjid Bunder, 27th November 1843, from Manockjee Cursetjee, Esq.

By the Royal Geographical Society of London.—Journal of the Royal Geographical Society of London, vol. xii., part 2 of 1842; Address to the Royal Geographical Society of London, delivered at the anniversary meeting on the 2d May 1843, by W. R. Hamilton, Esq., F.R.S., President.

By the Société Asiatique de Paris, through the Royal Geographical Society of London.—Simple Exposé d'un fait Honorable odieusement de Nature dans un Libelle recent de M. Pauthier, suivi, &c. Par Stanislas Julien; Supplement aux Vindiciæ Sinicæ; ou, Dernière Réponse à M. Stan. Julien; Journal Asiatique; ou Recueil de Mémoires, &c., tome xiv., No. 79, Novembre, Dec. 1842; Journal Asiatique; ou, Recueil de Mémoires, &c., tome i., No. 1, Janvier, 1843; Journal Asiatique; ou, Recueil de Mémoires, &c., tome i., No 4, Avril, 1843.

By the Société Asiatique de Paris, through Lieut. Ayrton of the 10th N.I., at Aden.—Journal Asiatique; ou, Recueil de Mémoires, &c., tome i., No. 1, Janvier; Journal Asiatique; ou, Recueil de Mémoires, &c. tome i., No. 3, Mars (2 copies); Journal Asiatique; ou, Recueil de Mémoires, &c., tome i., No. 4, Avril; Journal Asiatique; ou, Recueil de Mémoires, &c., tome i., No. 5, Mai; Journal Asiatique; ou, Recueil de Mémoires, &c., tome i., No. 6, Juin; Journal Asiatique; ou, Recueil de Mémoires, &c., tome ii., No. 7, Juillet, Août 1843,—with a note from Mr Young, dated 20th January 1844.

By the Société de la Géographie de Paris through Lieutenant Ayrton, of the 10th, at Aden.—Bulletin de la Société de Géographie rédigé Par M. Albert Montemont, &c, tome xviii. and xix. of 1842, with a note from Mr Young, dated 20th January 1844.

By the Bombay Chamber of Commerce.—Report of the Bombay Chamber of Commerce for the first quarter of 1843-44.

By the Government of Bombay.—Alif Laila; or, Book of the Thousand and One Nights, vols. iii. and iv., in Persian language; with a Letter dated 6th December, No. 3888 of 1843, from W. Escombe, Esq., Secretary to Government.

By the Rev. Geo. Pigott.—Strong's Greece as a Kingdom, &c., &c.; Grey's Travels in North-West and Western Australia, &c., &c., in 2 vols., with two Maps in

1st vol.; Mackenzie's Narrative of the Second Campaign in China; Taylor's Natural History of Society in the Barbarous and Civilised State, &c., &c., in 2 vols.; with a note dated 5th February 1844, from Rev. G. Pigott.

By Dr J. G. Malcolmson, F.R.S., Secretary to the B. B. of the R. A. S.—Journal of the Bombay Branch of the Royal Asiatic Society for October, No. 6 of 1843.

Paper.—By the Author. Journal of the Route between Tajoora and Ankober, with drawings, and a map of the same route surveyed by Assistant-Surgeon R. Kirk, with a note, dated Tannah, 29th January 1844.

Registers.—By the Author.—No. 1. One of the daily height of the River Indus, between the Fort of Bukkur and Roree, during the period of inundation of the year 1839. No. 2. Register of the daily range of the Thermometer during the hot season of 1839, kept in the Fort of Bukkur, and the maximum daily range, kept at Sukkur during part of the hot season 1840. By R. Kirk, Esq., Civil Surgeon; with a letter from the author, dated Tannah, 22d January 1844.

Letters.—Letters from Grindlay and Co., dated 28th July 1843, informing of a picture shipped on board the *Malabar*, Captain Pollock, being its value £60; with an enclosed bill of lading and a manifest.

Letter from Colonel T. Dickinson, dated 25th November 1843, acknowledging an extract from the minutes of the meeting of this Institution, held on the 2d inst., and likewise intimating the advantages which have been derived from the corporation of such most active and talented associations in carrying out the objects of an institution the welfare and reputation of which no one has more at heart than him.

Letter from Col. Sir H. Pottinger, Bart., dated 27th November 1843.

Letter from J. P. Willoughby, Esq., Secretary to Government, dated the 30th November, No. 1877 of 1843, acknowledging the receipt of this Society's letter No. 235, dated the 19th November last, respecting the charts referred to in Lynch's Memoir of the River Euphrates, on which reference will be made to the Right Honourable the Governor-General of India.

Letter from Messrs Remington and Co., dated 13th December 1843, with an enclosed copy of the account current with them, made up to the 31st July last, and under that date exhibiting a balance of Rs. 3873-1-33 in the Society's favour.

Letter from J. P. Willoughby, Esq., Secretary to Government, dated the 19th December, No. 3232 of 1843, transmitting an extract, paragraph 17, of a letter from the Honourable the Court of Directors, dated the 20th September, No. 15 of 1843, respecting the coins and fac-simile of an inscription stone from Aden, which were forwarded by them to England to the Royal Asiatic Society.

Letter from do. do., dated 25th January, No. 66 of 1844, informing that the Honourable the Governor in Council is not at liberty to furnish the Society with copies of the charts referred to in the Memoir of the River Euphrates, by Commander Lynch, I.N.

The paper of Dr Kirk, with its beautiful series of drawings, excited the chief interest: it was ordered to be published in one of the forthcoming numbers of the Transactions, the delay in whose appearance has been occasioned in part by the additions that have been made to it. It was considered unlikely that lithographic engravings of the whole of the drawings could be satisfactorily executed at Bombay; but such a selection was ordered to be made as would best illustrate the letterpress: these were to be got up in the best manner permitted by the state of the art in the Presidency. Dr Malcolmson suggested that copies of the recent works of the Baron Humboldt should be got out overland; though the Society had abandoned all idea of making a library for other than the purposes of consultation, it was important that they should be possessed of all the more rare and expensive geographical works its members were likely to desire. The chairman complimented the meeting on the highly satisfactory state of the funds of the Society, which, after the payment of the heavy bill about to fall due for printing two numbers of the Transactions, would still leave about Rs. 1000 in the treasurer's hands, with nearly Rs. 1500 more of income for next year from subscriptions. Though the meetings were on some occasions not very numerously

attended, the amount of donations laid on the Society's tables on each occasion when it met, as well as the alacrity with which all payments were made into its treasury, gave sufficient indications of the unabated interest that continued to be felt in its proceedings. The meeting then adjourned.

The Annual Meeting of this Society took place on Thursday the 2d May 1844, *at 3 o'clock* P.M.

Captain D. Ross, *President* of the Society, in the Chair;—

Present.—J. P. Willoughby, Eq.; Commander H. B. Lynch, I.N.; Dr J. Burnes, K.H., F.R.S.; and Dr Geo. Buist, Secretary to the Society. The minutes of last meeting having been read, some conversation ensued out of the resolution formerly adopted as to having a selection from the drawings of Dr Kirk's Journal lithographed or engraved: it was now agreed this should be done in London, so as to accompany the Transactions, provided the expense did not exceed Rs. 500. The following were elected office-bearers for the year:—

Three Vice-Presidents.—Captain Sir Robert Oliver, R.N.; J. P. Willoughby, Esq.; Major-General Vans Kennedy.

Twelve Resident Members.—Lieut.-Colonel P. M. Melvill; Captain E. P. Del Hoste; Commander H. B. Lynch, I.N.; Dr R. Brown; Dr J. M'Lennan; Rev. G. Pigott; Dr J. Burnes, K.H., F.R.S.; Ball Gungadhur Shastree, Esq.; Dr C. Morehead; J. Bowman, Esq.; Major-General D. Barr; the Hon. L. R. Reid, Esq.

Eight Non-Resident Members.—Major H. C. Rawlinson; Major W. C. Harris; Major R. Leech; Captain R. Shortrede; Lieut. H. A. Ormsby, I.N., F.R.S.; Captain G. Le G. Jacob; Lieut.-Colonel O. Felix; Lieut. J. C. Cruttenden, I.N.

The following Gentleman was elected a member of the Society:—

John Smith, Esq.—Proposed by Dr G. Buist, and seconded by the President, Captain D. Ross, I.N., F.R.S.

The following Statement of the Funds was laid before the meeting:—

Annual Statement of Receipts and Disbursements of the Bombay Geographical Society, from 1st May 1843 to 30th April 1844.

DISBURSEMENTS.

1844.		R.	A.	P.
April 30,	To Printing,	2823	0	0
,,	,, Establishment,	564	0	0
,,	,, Contingent expenses,	78	8	0
,,	,, Subscription received from Dr J. Mackenzie towards the late Dr Heddle's Monument, and paid into hands of Treasurers on the 6th Dec. 1843, (*vide* page 32 of the General Cash-Book, No. 2),	50	0	0
		3515	8	0
,,	,, Cost of postage, bills, &c., on account of the late Sir Alexander Burnes's portrait, Rs. 26 3 6			
,,	,, Cost of portrait, 827 9 5			
		853	12	11
		4369	4	11
"	" Balance in favour of the Society this day,	1597	6	11
	Rupees	5966	11	10

RECEIPTS.

1843.		RS.	A.	P.
July 31,	By balance in the hands of the Treasurers this date,	3873	5	4
1844.				
Apr. 30,	,, Amount of Government subscriptions for twelve months, at 50 Rs. per mensem,	600	0	0
,,	,, Do of subscriptions of members for this year,	1343	6	6
,,	,, Do. of one copy of this Society's Proceedings sold	2	0	0
,,	,, Do. of six do. of the Royal Geographical Society's Journal sold,	18	0	0
		5836	11	10
,,	,, Do of subscriptions of members to Sir A. Burnes's Portrait from 1st August 1843 up to this date,	130	0	0
	Rupees	5966	11	10

(Signed) Geo. Buist, Secy. to the Society.
Bombay, 30th April 1844.

The following papers, received since last meeting, were laid on the table: a part of them had been placed in the printer's hands by order of the committee, and were now in type :—

Papers.—By the Author.—Note on Lacusterine Tertiary Fossils, from the Vindiah Mountains, near Mandoo; and on the period of the elevation of that chain. By Dr J. G. Malcolmson, F.R.S.

By the Author.—Meteorology of Aden. By Corporal Moyes.

By Government.—Extract of a Journal kept during a partial inquiry into the present resources and state of North-eastern Africa, with Memoranda. By Lieut. W. Christopher, I.N., commanding the Hon. Company's brig of war *Tigris;* with a letter from Mr Chief Secretary Willoughby, dated 26th March.—No. 225 of 1844.

By the Author, through J. P. Willoughby, Esq.—Observations on the Runn. By Captain G. Fulljames; with a rough sketch of the Camp at Cusba, on the north side of the large Runn, dated Ahmedabad, 6th April 1844; with a note from Mr Willoughby, dated 13th April 1844.

By the Author.—Narrative of a Hasty Trip to the Frankincense Country. By G. W. B. Kempthorne, Esq.

By Government.—A Memoir on the country between Bagdad and the Hamreed Hills, drawn up by Lieut. H. W. Grounds of the Indian Navy, dated Bakhoba, Wednesday the 28th August 1839.

Books.—By Government.—Two reports by the superintendent of roads and tanks, for the years 1841–42, and 1842–43, dated Poonah, 2d Sept. 1842, and 11th July 1843; with a letter from Mr Secretary Escombe, dated 11th March.—No. 693 of 1844.

By the Chamber of Commerce.—Report of the Bombay Chamber of Commerce for the second quarter of 1843–44.

It was moved by Mr Willoughby, seconded by Dr Burnes, and agreed to unanimously, that the Society do record an expression of deep regret at the loss of one of the most distinguished of its members, Dr John Grant Malcolmson, who had fallen a victim to his enthusiasm in the pursuit of geographical science. The paper on the elevation of the country near Mandoo had been sent to the Secretary from Surat, and was the last, in all likelihood, prepared by him for publication.

The following report, drawn up by the Secretary, was laid on the table and ordered to be printed :—

It is not necessary for me to apologise for the resumption of the time-honoured practice, so ably pursued by a former Secretary, of presenting, at the anniversary meeting, a short report of the proceedings of the Society, and of the progress of geographical research within the field of our more immediate cognisance for the preceding year. The omission of this for the two past anniversaries occurred from circumstances over which I had no control: in May 1842 I was appointed permanent, after having been for a few weeks only provisional, Secretary: and in 1843 the affairs of the Agricultural Society, and arrangements then in progress and now completed, pressed along with my own more immediate professional engagements, so severely on my time, that I was unwilling to attempt that which, under the circumstances, could have been so imperfectly performed; and now, without further circumlocution, I shall endeavour in so far to follow the footsteps of my predecessor in a task the fact of whose execution requires no excuse, however much its faultiness may stand in need of apology.

The Abyssinian Embassy having returned to Bombay shortly antecedent to our last annual meeting, (on the 14th April 1843,) little more of their proceedings was then known than that recorded in the paper from the pen of Major Harris in reference to the great River Hawash, presented by Government to the Society, and now forming a part of its printed Transactions. Since then the great work of Major Harris has made its appearance, while a paper by Captain Grahame, a member of the mission, appeared in the No. 140 of the *Bengal Asiatic Society's Transactions for* 1843. A report by Dr Kirk, on the route from Tadjurra to Ankober, travelled by the mission, appeared in the 2d part of the

twelfth volume of the *Transactions of the London Geographical Society* for 1843. The most valuable paper which has yet appeared, connected with the explorations of the mission, has fallen to the share of the Bombay Society—the extended journal of Dr Kirk, of which that published in the *London Journal* is merely an outline: the late date at which this was sent in to the Society, and the delay occasioned by the attempt to have a selection of the drawings with which it is illustrated lithographed, has, combined with other causes of an unavoidable nature, considerably retarded the appearance of the forthcoming number of the Society's Transactions, in which it was resolved by the Committee that it should appear.* So far as appears from what has been already given to the world, the mission has added considerably less to our stock of knowledge on Geography and Natural History than might have been expected, and could have been desired. The very defective nature and scanty number of the instruments with which they appear to have been provided, greatly impeded trigonometrical investigation: and this most essential portion of the fitting-out of an expedition seems to have been left very much to accident. In nothing are the stores of the Bombay Government more defectively supplied than in philosophical instruments; those possessed by them are not only few in number, but antiquated in form, and indifferent in quality. In Bombay in 1841 there was no private dealer† from whose stores travellers could be supplied: and an expedition, from whose exertions much in the way of physical research might have been looked had they been provided with the means of investigation, was despatched on a mission of two years duration provided with a single sextant,‡ a couple of chronometers, two or three thermometers; with barometers which became useless from leakage before the mission had well begun its journey. A telescope was afterwards provided from Bombay, but of such indifferent quality, that it was found unserviceable for the observation of the satellites of Jupiter: so that a mission meant to traverse, or to reside, in a country whose physical character was very indifferently known to us, and the expense of which, including the pay of the officers employed in it, must have amounted to £6000 or £8000, was, for want of some £150 worth of instruments, left destitute of the means of pursuing some of the most important investigations in which they could have been engaged. Dr Kirk and Lieutenant Barker appear to have effected all that could have been expected of them with the means at their command; the altitudes of all the more prominent positions visited by these gentlemen have been estimated with apparent care from the temperature at which water boils, and two several sets of astronomical observations—one by each of the parties just named—give with apparent accuracy a series of latitudes and longitudes not before ascertained. Ankober, the head quarters of the residence of the mission, is 370 miles from the sea, and 8200 miles above its level; its latitude is 9 deg. 35 min. 1 sec. N.; longitude 39 deg. 53 min. 48 sec. E. The most notable position next to this, as described by the mission, is that of the Salt Lake, of which a most interesting account will be found in Dr Kirk's memoir; it is situated in latitude 11 deg. 37 min. 30 sec. N.; longitude 42 deg. 33 min. 6 sec. E., and is five hundred and seventy feet below the level of the sea; after the Dead Sea probably the Lake of the greatest superficial depression known to us. The Society has been fortunate in having been put in possession in the course of the year, of a large body of varied and interesting, though not very exact, information on the geography and statistics of the north-eastern portion of the sea-coast of Africa. In our Transactions have been for the first time printed the journals of Captain Smee and Lieutenant Hardy, in the cruise in quest of the great river, long supposed to disembogue itself into the sea near the equator. Captain Harris's paper already referred to, embodies the information

* The Society, it will be seen, resolved at this meeting to have a selection from the drawings engraven at home.

† Within the present year Messrs J. Jamieson & Co. have provided themselves with a small stock of instruments of first-rate quality, by Adie of Edinburgh, which help to supply a desideratum in Bombay.

‡ A sextant of 9 inches, made by Jones, reading to 10 seconds.

collected amongst the natives on the same subject; while the extended memoir of Lieutenant Christopher, presented to the Society by Government, places the question of the existence of the stream beyond the reach of doubt, though it leaves us sadly in the dark as to the source whence it arises, the extent of country which it traverses, or the terminus whitherward its waters tend. While we have been supplied with the memoir in question, it has unfortunately—as in the case of the map illustrating the paper of Captain Lynch, on the geography of the Euphrates—been considered necessary to withhold from us the chart which should have accompanied it. The course of the Haines River, as it has been called, in alleged defect of a native name, has been traced by Mr Christopher for the space of 110 miles: the description given of it is obscure, probably in consequence of the want of the map which has been already referred to. The country traversed by this, and the river just now for the first time paticularly noticed, is occupied by a population estimated at 150,000: the soil appears to be a rich alluvium, and the condition of the people gives promise of much advantage arising to commerce, from the improvement of our intercourse with this portion of Africa. The fragments of information about to appear in the forthcoming number of the Transactions, are such as must make us feel anxious for an increase of information on the subject; and may, it is hoped, stimulate the Government to undertake further surveys of a portion of the country so near and so little known to us—which, alike in a mercantile as in a geographical point of view, is deserving of the most minute examination.

It is much to be regretted, that so little of the information which must have of late been collected in reference to the geography of the sea-coasts and islands of China, by officers of the Indian Navy or of vessels frequenting the port of Bombay, should hitherto have fallen into the Society's hands. It frequently happens, that valuable sets of soundings and bearings are noted by captains of merchant ships on their own private charts, which never reach the public eye at all, though of infinite importance to navigators.

A surveying vessel, under the command of Mr Montriou, is at present employed on the Malabar coast, and from this it is hoped that much information may be derived. Mr Montriou has left—as do most officers starting from Bombay—very defectively supplied with instruments, and he has unhappily been disappointed in not having the services of the talented medical officer* expected to have accompanied him as naturalist. These wants will, it is hoped, be supplied before the resumption of the survey, which must certainly be interrupted from June to October by the rains.

It is hoped that our knowledge of the geography of the interior of Scinde may be increased by the investigations of Captain Baker, surveyor of tanks and canals, though his occupations do not very strictly bear on research purely geographical.

The Society has, in the course of the last year, according to its practice in cases of emergency, supplied a gentleman (Lieut. Showers) proceeding to the Pacific, with books from its library—on promise of there being replaced so soon as they can be had from England.

* Dr Carter, now on sick leave in the Deccan, one of the most industrious and promising naturalists in the Bombay Medical Service.

TRANSACTIONS

OF THE

BOMBAY GEOGRAPHICAL SOCIETY.

Captain D. Ross, F.R.S., President, in the chair.

B. A. R. Nicholson, Esq., and Manockjee Cursetjee are elected Members of the Society.

Correspondence.—Read a letter addressed to the Secretary, from Mr Layard, dated Karrak, 20th December 1840, as follows:—

SIR,—I have been residing for the last three months amongst the Baktiyari, and am returning to their mountains immediately. My friendship with their chief, Mohammed Taki Khan, has enabled me to visit most parts of the Baktiyari country, and I have succeeded in reaching Susa, and other places of interest, to which my attention was chiefly drawn by Major Rawlinson's pamphlet, which appeared in a late number of the London Geographical Society's Journal. Under these circumstances, I much regret that I am totally unprovided with instruments for laying down the country through which I pass. Those I possessed on leaving England have suffered so much during a long journey through Asia Minor, Syria, &c., as to be at present totally useless.

Should the Bombay Geographical Society feel inclined to provide me with any instruments, I shall be most happy to make use of them, and to transmit the result of my geographical inquiries to the Society. I shall probably, in spring, visit the higher mountains of the Baktiyari and the Corgelous, which are inaccessible during the winter months, and a mountain barometer would prove exceedingly useful in determining their heights. I have discovered several cuneiform inscriptions and sculptures, and have heard of several which I shall have an opportunity of visiting.

After leaving the Baktiyari country, it is my intention to proceed

to Yezd and Kerman, and endeavour to reach Candahar through the Seistan; and, I believe, circumstances are favourable to my undertaking.

The instruments I shall, therefore, chiefly require are a Kater's Schmalcalder's compass, a mountain barometer, a thermometer, and a watch.

I am known to Captain Washington, Secretary to the Royal Geographical Society, and would have made this application to him, but the difficulties of transmission from England are so great, and the time that would elapse before any packet could reach me so considerable, that I have considered it useless to do so.

Should the Society take any interest in the examination of the country I am about to visit, and offer any suggestions, I shall be happy, as far as is in my power, to attend to them, &c.

The Secretary is authorised to forward any of the instruments required by Mr Layard that can be procured in Bombay.

A letter from C. F. Beke, Esq., dated Tajourra, Dec. 1840:—

Dear Sir,—At the suggestion of my friend Dr Lush, I have the pleasure of transmitting a specimen,* together with a few seeds of the only plant that I have found at this place (on the eastern coast of Africa, just opposite Aden) applied by the natives to any useful purpose. Its name among the natives (called *danákil* by the Arabs, but among themselves *affar*) is *anagalli*, and they employ the *leaves* for tanning goats' and other skins used by them for holding water, &c. The process is as follows:—They pound the fresh leaves of the *anagalli*, and apply the paste thus formed to the skins, (after having well cleaned them,) rubbing it well in, and allowing it to remain for twenty-four hours, frequently working it about, and then rolling the skins up. They are then taken to the sea-shore, and well washed, and then filled with sand, which is rammed hard down with a stick, in order that the skins may be fully stretched in the drying, which is now allowed to take place; this completes the operation.

In this part of the country there is very little vegetation, the surrounding plain and cretaceous hills being scantily covered with the *anagalli* and two or three different sorts of acacias. *Cultivation* of any sort is not known; the maize, grain, and dates eaten by the natives being brought from the interior. The men generally chew tobacco, which they import from the opposite coast, and which they render more pungent by an admixture of wood ashes. They do not smoke, nor am I aware of their using any other narcotics. They smear their hair and bodies with the clarified fat of their goats, &c.

I do not send you any further specimens, as I possess no convenience for making a package larger than a letter; but I trust I may have an

* The specimen belongs to a species of Cadaba, nearly allied to Forskal's *C. glandulosa*.

opportunity of addressing you from the interior with something more interesting than the contents of the present letter.

Should you have any suggestions or inquiries to make, (to which I shall be most happy to attend,) Captain Haines, at Aden, will take charge of any letters addressed to me to his care. I am proceeding to the kingdom of Shoa, in the south of Abyssinia.

I have forwarded the only case I had (one of them I brought from England) to Captain Haines, at Aden, requesting him to send it to you, and I have now to trouble you to take charge of it, and to send it to London by the first good opportunity. It contains specimens of the rocks in this vicinity, and some shells collected here. The whole vicinity is composed of marine limestones of recent formation, which have been subjected to extensive volcanic action.

I have just taken from a boy a couple of specimens of *Solanum*. He had an armful of the plant, and I asked him what he was going to do with it. He said, "Eat it;" and I understand that they boil the *leaves* in water, and eat them. This is not an usual article of food among the people; but the children are allowed to use it in the way mentioned, &c., &c.

C. F. BEKE.

A letter from Lieutenant F. Ayrton, forwarding two communications from M. D'Abbadie, of which the following is read:—

BARBERAH, 28*th Nov.* 1840.

MY DEAR SIR,—I have now been only five days here, but as Shadly will depart this evening for Syara and Aden, I shall hasten to give you the result of my first inquiries concerning Barberah and its neighbourhood. We left Aden at 4 P.M., and although close-hauled to the *aziab*, or breeze, of the N.E. monsoon, we arrived in sight of this village at sunset on the following day. We had afterwards to double a low peninsula of marine formation, in order to tack into the *khor*, or inlet, which, extending upwards of a mile in a direction parallel to the general features of the Somali coast, is perhaps the only natural advantage which has contributed to found the transient town of Barberah. The bottom is flat, and at low tides nearly 200 yards of black soft sand intervene between the first houses and the water, which lies here almost without a ripple. The village, town, or fair (I scarcely know which term to apply) is a little more than 300 yards long where it fronts the beach; its depth inwards is less considerable, and a large vacant space intervenes to separate rival tribes, for three Somali clans claim a right to the soil, viz., Eyyal ho'gh, Eyyal gedeed, and Eyyal Shertown. The houses or huts are built of poles tied together, and covered with rush mats and surrounded with thorns. I should estimate their present number at about 400, which admits a population of nearly 2000 souls; but new huts are erected daily, and small caravans are already pouring in. I have not seen a head of horned cattle; milk is scarce, dear, and bad; sheep are brought from at least six hours' distance, and

the only good water comes by sea from Syara. The whole surrounding country is a dreary, naked desert, bounded by bleak distant hills, and habitable only during the present monsoon, which preserves the weather remarkably pleasant and cool. In the few rambles which I have taken towards the south and south-east, I have found numerous coral rocks evincing comparatively a modern retreat of the sea. They are now generally surrounded or covered by deposits of alluvial silt, produced by torrents of rain tumbling for a few hours from the hills, and subsiding in the flats, where water is found everywhere at a depth varying from one and a half to two yards; but, owing to the marine substratum, this water is detestably brackish. M. Prendergast, who has visited the Doobara rivulet, three hours' walk off, met several small herds of antelopes, with a few hares and even squirrels: wild boars abound a little farther inwards.

Barberah is perhaps the only trading port in the world where there are no customs of any sort; but this deficiency is supplied by a new method, which has not yet been classified by our economists. Every trader not belonging to one of the three tribes is obliged to choose an *abban* or protector, who is his judge, servant, broker, and often dolt, thief, and tyrant. No excursion can be attempted, no transaction effected, without the interference of the *abban*. This term, like that of *ghafyr* used at Suez, between Bedoo and Christians, is applied to the protector and to his client, and a Somali stranger, who does not know me by name, must, if polite, call me *abban*. The protector has a right to receive a daily dole of two loaves of *dourrah*: he also expects a small present at parting; but it may well be supposed that his profits depend chiefly on brokerage. As Europeans are always victims in Africa, I need not tell you that my *abban* is eminently of the dolt species, and although he affects great pretensions to Arabic, he cannot string two words together, save a few cant phrases of the uncivilising Mussulman faith.

The Somal dress here is the same loose and flowing white sheet so prevalent in Aden. Their women tie it with sundry folds like a petticoat, leaving a corner to throw diagonally over their shoulder. Young ladies wear their hair in close flat plaits like the Abyssinians; but the Somali matrons confine their black tresses in a pretty black net like the peasants of Southern Europe. In their native pastures the Somal carry two lances, lighter, shorter, and less substantially counterpoised than those of upper Ethiopia: in war one is thrown, the other being generally used as a pike. The Somali sword is under twenty inches in length, broad, straight, and double-edged, like those used in the French artillery. These are employed as knives in the peaceful transactions of Barberah. The bows are twice as stout as those used in modern English archery. The ends taper suddenly with a curve almost at right angles, and the string is a well-twisted gut. The arrows are short and clumsy, iron-headed, and poisoned. The shields are made of rhinoceros hide, remarkably tough, light, and handsome.

The feast of Bairam is only just ended, and the first caravan will enter in a day or two, bringing melted butter, myrrh, incense, and gum-arabic, chiefly from the Somali country. The Harar caravan will arrive in eight or ten days, bringing the best slaves in the world, as a Mughreby dealer emphatically told me; coffee in large quantities, destined to be mixed, baptized, and adulterated in Mocha; mules, horses, *wars*—a dye plant used at Muscat—and sundry other things which I have not yet heard of. They take in return chiefly cotton cloths, brass, and copper. The second Harar caravan will arrive in three months hence, bringing no slaves, but a good deal of civet. I have been credibly informed that a Galla boy is often sold here for fifty dollars, and fetches as much as 120 in the ports of Arabia. Coffee is paid in cotton cloth, three of which valued *here* at a dollar a piece, are given for one *frazle*. From ten to fifteen of these are sewed in a mat bag which pays from one-half to three-quarters of a dollar in freight to Mocha. Cattle of all sorts are shipped, not here but at Syara. In the caravan season a good mule is sold for ten, fifteen, or twenty dollars: horses are cheaper, but probably inferior in quality.

Harar, capital of the small district of Harar-gay, surrounded by Galla tribes, is encircled by a continuous wall with five gates. Its language is neither Somali, Dankaly, nor Galla; but appears to me, on first examination, an Amharic dialect. The inhabitants are strict Mussulmans: the late emir has been deposed by his nephew, who now keeps him in prison. An ancient law prohibits any white man, *i.e.*, Turk or European, from entering the town of Harar: even the Christian merchants of Shoa do not venture thither. The Harar lances give a good idea of their skill in manufacturing iron.

ANTHONY D'ABBADIE.

A letter from Major Stirling, communicating the two following notes:—

1*st*.—A Visit to the Falls of Sansadurra.

February 1841.

The Falls of Sansadurra are two miles below the city of Mhysir in Nemaur, where the river Nerbudda falls over, or forces its way through, a rocky barrier two miles in breadth. Immediately above the barrier the Nerbudda resembles a lake about a mile in breadth. It passes the barrier in two channels, that on the southern side being only about one hundred yards wide; and it can scarcely be called a fall, but a foaming, impetuous, and roaring rapid, while the other, near the middle of the bed of the river, is the great Fall, where two-thirds of this great river, contracted to a breadth of two or three hundred yards, rushes over its rough and rocky bed, and finally precipitates itself over ten or twenty feet of perpendicular rock into a chasm below. The chasm runs parallel to the Fall, receiving the whole of its waters, as in a trough, and, as it is only about twenty feet wide, it must be of great

depth to contain them. Its rocky sides bound it like a wall; but although they are in some parts rent and broken, and formed into fantastic shapes by the violence of the stream and its whirling eddies, in none do the waters escape from it till conveyed unbroken and entire by a wide and more gentle channel. Below the barrier the two channels re-unite, and form a lake-like sheet of water, like that above it.

Standing on the rocky margin of the chasm, and facing the Fall, the view is grand and imposing, although destitute of many of those features which add beauty and interest to waterfalls in other situations. There are no trees—nothing but black naked rocks on either hand; but the ceaseless thunder and deafening roar of the mighty river, its boiling eddies, its foaming waters, as they rush towards you only a few yards distant, are enough to fill the mind, and render other objects superfluous.

The rocky barrier is composed of tabular trap, exhibiting no signs of dislocation or disturbance, except by the force of the river; nor did I see a single imbedded pebble or mineral of any kind. The river has deposited a calcareous crust on some of the rocks, but it is quite superficial.

The barrier was, doubtless, at some remote period, complete, and on a level, or nearly so, with the present height of the banks; so that, before the river burst its barrier, the site of Mhysir was nearly the centre of a vast lake or basin. By the bursting of the barrier, that lake or basin has been partially drained; its bed has sunk, assuming the character of a river; and were the barrier entirely removed, the Nerbudda at Mhysir, instead of being a fine sheet of water, a mile wide and four long, and twenty feet deep, as it now is, would be diminished into a comparatively petty stream.

The banks of the river between Mhysir and Sansadurra, particularly the right, which I have examined, afford strong proof of the above. The bed of the river is trap, but lower, twenty or thirty feet of the bank are composed of a more or less hard calcareous deposit, such as is usual at the bottom of lakes: then comes an irregular bed of loosely-cemented round stones of very hard quartz and limestone, ten or twelve feet thick, or sand such as abounds in the Nerbudda above Mundleysir, and then two distinct thick deposits of, I conceive, transported matter, of a saline and calcareous nature, decidedly of a different composition from the soil of the country half a mile or a mile from the river. These superior deposits rise into hillocks and rugged eminences above the neighbouring country, and their remote antiquity is proved by their, in some places, affording support to large trees and ruined buildings.

I am inclined to believe that the volume of water in the Nerbudda, in the fair season, has been much overrated, and that its great breadth of six hundred, nine hundred, and twelve hundred yards, as given by Sir J. Malcolm, has either been estimated in the monsoon, or where its breadth is owing to barriers that dam it up, to rocks and other impediments, which spread its waters over a large surface. I have come to

this opinion from seeing the whole of the river below Sansadurra, when not running with any extraordinary velocity, and three or four feet deep, within a channel of three or four hundred yards. That was a fair place, I conceive, to make a section of the river.

The whole fall of the river over the two miles at Sansadurra cannot be less than fifty feet. From the hardness of the rock, its height and length, and the vast body of water which rolls over it in the monsoon when the river is flooded, I have formed the opinion that no remunerating labour could ever render the river Nerbudda navigable at Sansadurra, nor can any reasonable hope be formed that land carriage at that spot would overcome the difficulty.

2*d*.—Notice of Granite protruding through the Trap Rock in the Bed of the river Nerbudda at Mundleysir.

In the middle of the Nerbudda, opposite to Mundleysir, there is a saddle-shaped rock of trap, the highest part of the arch or saddle rising fifteen or twenty feet above the bed of the river. The rock is rather coarse but compact black trap, and in some places inclining to porphyritic, but nowhere exhibiting an approach to columns, nor is there any appearance of much disturbance of the strata.

On the northern edge of the saddle, I found a huge isolated block of granite, about forty feet in length, twenty in breadth, and seven in thickness, the trap in some places firmly adhering in pieces even to its upper edge, the two rocks showing the colours of deep black and gray, as distinctly and contrastingly as if they had been painted with a brush. The trap in some places penetrates the granite as in veins, or, it may be, *vice versa*.

At first it appeared to me that the granite block was of the nature of a boulder, brought by some unknown power, at least in this country, from a distance; but further examination proved that not to be the case, for I ascertained it to rest on a solid foundation of granite not much larger than itself, distinctly protruding through the trap, which encircled it as firmly and closely as if it had been applied by human means. In some places where the granite and trap are in contact, the latter exhibits strong appearances of the action of fire, or at least of decay.

The large block, which is rent in several places, appears to me to have originally stood erect, and that it has fallen into its present position by the force of the current; but in either case the adhesion of pieces of trap at the upper edge of the granite, seven or eight feet from the ground, is a very curious circumstance, and will not fail to give support to existing theories on the subject.

Sir John Malcolm's work on Central India, as well as every other authority, published and unpublished, that I am aware of, have led me to believe that there is no granite in Western India between the latitude of Goa and the Vindhya mountains. I am, therefore, inclined to hope that the information now afforded may prove new and interesting.

I may here mention that Mundleysir stands on the north bank of the

Nerbudda, in the country of Nemaur, about fifteen miles south of the Vindhyas, a range understood to be composed entirely of trap. The bed of the Nerbudda, and its banks, about thirty or forty feet high, are also composed at Mundleysir of trap, and I have not been able, in any part, to discover any granite but what I have described, and a few detached fragments of no great magnitude in its immediate neighbourhood.

I beg to forward, by the bhangy, specimens of the granite and its adhering trap.

The above communication may appear to be more of a geological than a geographical character; but, trusting to the known desire of our Society to extend its usefulness in every way, I have, in the absence of a Geological Society, taken this opportunity to make it.

W. STIRLING, Major, 17th Regiment,
Bombay Native Infantry.

MUNDLEYSIR, *9th February* 1841.

PAPERS.

1*st*. Reports, by A. Gibson, Esq., on the Iron Ore found in Malwan; on the Teak Plantations of the Southern Concan; and on the Alluvial Soils suitable to the Growth of Foreign Cotton .	Communicated by Government.
2*d*. Journal of a March from Ahmedabad in Guzerat, to Sukker in Upper Scinde, by Captain de l'Hoste	Communicated by the Author.

Library.—The second Collection of Books purchased for the Society by the Secretary of the Royal Geographical Society, in value £45, 11s. 6d., having arrived per ship *Thomas Coutts*, is inspected by the Members; and thanks are voted to Captain Washington for the trouble he has taken in selecting the Works, which have all arrived in excellent order.

DONATIONS.

Books.—Shurah Ool Islam . .	Presented by Government.
Wilson's Vishnu Purana . .	
Journal of Royal Geographical Society, Vol. X., part ii. . .	Royal Geographical Society.
The following works by the late W. Marsden, D.C.L., F.R.S. :—	
Travels of Marco Polo . .	
History of Sumatra . . .	
Numismata Orientalia, 2 vols. .	
Miscellaneous Works	
Remarks on the Sumatran Language	Col. W. Martin Leake, D.C.L., F.R.S.
On the Chronology of the Hindoos	
Memoir of the Life and Writings of the late W. Marsden. Written by himself	

On the Fossils of the Eastern portion of the Great Basaltic District of India . . .	J. G. Malcolmson, Esq., F.R.S.
Burney's Chronological History of the Voyages, &c., in the Pacific Ocean, Vol. IV. . . .	Manockjee Cursetjee, Esq.
Two numbers of Journal Asiatique	M. D'Abbadie, through Lieut. Ayrton.

Works purchased for the Society by Captain Washington, R.N., Secretary to the Royal Geographical Society :—

[Received in July 1840.]

	Vols.
Crawfurd's Embassy to Siam	2
Ditto Ditto Ava	2
Ditto History of the Indian Archipelago	3
Murray's Discoveries in Africa 2, Asia 3, and America 2, . . .	7
Flinder's Voyage to Terra Australia, with Atlas	2
Fraser's Khorasan	1
Ditto Travels on the Shores of the Caspian Sea, . . .	1
King's Survey of Australia	2
Salt's Voyage to Abyssinia	1
Syme's Embassy to Ava	1
Turner's Embassy to Thibet	1
Beechey's Voyage to the Pacific and Behring's Straits . . .	2
Beaufort's Karamania; or, Description of the South Coast of Asia Minor, &c.	1
Pausanias's Description of Greece, by Taylor	3
Humboldt's Personal Narrative of Travels to the Equinoctial Regions, &c., printed in 1814, in 5 vols.	4
Humboldt's Personal Narrative, vol. VI., parts 1 and 2, printed in 1826	2
Ditto Ditto Ditto vol. VII., printed in 1829 . .	1
Ditto New Spain, by Black	4
D'Anville's Ancient Atlas and Geography of the Ancients . .	1
Ditto Analyse Géographique de l'Italie	1
Ditto Antiquité Do. de l'Inde	1
Ditto Memoire sur la Mer Caspienne	1
Ditto Notice de l'Ancienne Gaule	1
Ditto Ancient Geography	2
Burckhardt's Travels in Arabia	2
Ditto Notes on the Bedouins and Wahabys . . .	2
Ditto Travels in Nubia	1
Ditto Ditto in Syria and Holy Land	1
Proceedings of the African Association	2
Owen's Narrative of Voyages to Africa, Arabia, and Madagascar .	2
Rennel's Geography of Herodotus	1
Ditto Ditto of Western Asia, with Atlas	2
Ditto Illustrations of the Retreat of the Ten Thousand, &c., with Atlas	1
Ditto Memoir of India	1
Mitchell's Australian Expedition, 2d Edition	2
Vincent's Nearchus and Periplus, Commerce and Navigations of the Ancients	2
Voyage de Niebuhr en Arabie	4
Hamilton's Account of Nepaul	1

	Vols.
Hamilton's East India Gazetteer	2
Ditto Description of Hindostan	2
Forster's Overland Journey from Bengal to England	2
Edinburgh Cabinet Library.—Persia 1, Arabia 2, China 3, Egypt 1, Nubia and Abyssinia 1	8
Dalrymple's Collection of Voyages in the South Seas	1
Smyth's Sicily and its Islands	1
Ellis's Polynesian Researches	4
Do. History of Madagascar	2
Humboldt's Fragmens Asiatiques	2

[Received in February 1841.]

Abel's Journey in the Interior of China	1
Auber's Rise and Progress of the British Power in India	2
Barrow's Travels in China	1
Ditto Voyage to Cochin China	9
Beeckman's Voyage to Borneo	1
Bernier's Travels in the Mogul Empire	2
Browne's Travels in Africa, Egypt, and Syria	1
Buchanan's Journey through Mysore, Canara, and Malabar	3
Burnes's Travels to Bokhara (new Edition)	3
Charlevoix Histoire du Japan	2
Davy's Travels in Ceylon	1
Davis's China	2
Dubois on the Manners and Customs of India	1
D'Anville's Memoires sur l'Egypte	1
Ellis Amherst's Embassy to China	1
Elphinstone's Kingdom of Cabool	2
Forrest's Mergui Archipelago	1
Ditto Voyage to New Guinea	1
Franklin's Tour from Bengal to Persia	1
Gentil's Mers de l'Inde	2
Golownin's Japan	2
Grant's History of Mauritius	1
Hall's Voyage to Loochoo	2
Hanway's Travels in Persia, &c.	4
Hamilton's East Indies	2
Hasselquist Voyage du Levant	1
Herodotus, by Beloe	4
India, Edinburgh Cabinet Library	3
Irvin's Voyage, Red Sea, &c.	1
Keate's Pelew Islands	1
Kinnier's Persian Empire, with Map	1
Knox's Historical Relation of Ceylon	1
Kirkpatrick's Account of the Kingdom of Nepaul	1
Lander's Expedition to the Niger	3
Leyden's and Erskine's Memoirs of the Emperor Baber	1
Lindsay's Letters on the Holy Land	2
Le Brun Voyages en Muscovie, Perse, Levant, &c.	5
Lane's Modern Egyptians	2
Morier's Two Journeys into Persia	2
Niebuhr's Dissertation on the Geography of Herodotus, with a Map	1
Olivier's Travels in Persia	2
Osbeck's Voyages to China	2
Ouseley's Ebn Haukal	1
Pottinger's Travels in Persia, &c.	2
Pococke's Travels in the East	2

	Vols.
Raffles's History of Java	2
Memoir of the Life of Raffles	2
Renaudot's China	1
Reid's Law of Storms	1
Spencer's Circassia, &c.	2
Sonnarat's Voyage aux Indes Orientales	2
Staunton's Account of Macartney's Embassy to China	2
Stavorinus's Voyages to the East Indies	3
Tournefort Voyage du Levant	2
Thevenot's Travels	1
Waring's Tour to Sheeraz	1

At the Anniversary Meeting, held in the Society's Room, Town Hall, on Thursday the 6th May 1841—

PRESENT—Colonel T. Dickinson, Vice-President, in the chair; Lieut. W. S. Suart; P. Ewart, Esq.; Dr C. Morehead; J. G. Malcolmson, Esq., M.D.; Dr J. Burnes, K.H.; George Buist, Esq.; Dr J. Bird; Major T. B. Jervis; John Macleod, Esq.; J. J. Waterston, Esq., N.I.I.N.; Captain G. Fulljames; Ball Gungadhur Shastree; and J. F. Heddle, Esq., Secretary.

Minutes of the Quarterly Meeting held on the 19th February 1841 are read and approved.

The statement * of the Society's account, from April 1840 to April 30th, 1841, is laid before the meeting, showing a balance at the latter date of Rs.1651 9a. 1p. in favour of the institution.

The voting-lists are then examined, and the following gentlemen announced as office-bearers for the ensuing year, being elected by the general votes of the Society :—

VICE-PRESIDENTS—Colonel T. Dickinson, Captain R. Oliver, R.N., and J. P. Willoughby, Esq.

COMMITTEE—Resident: Lieut.-Col. N. Campbell; Major T. B. Jervis, F.R.S.; Lieut. H. A. Ormsby, I.N., F.R.S.; Dr J. Burnes, K.H.; A. B. Orlebar, Esq.; W. C. Bruce, Esq.; Dr R. Brown; Dr C. Morehead; Captain G. Fulljames; J. Skinner, Esq.; G. Buist, Esq.; J. G. Malcolmson, Esq., M.D. Non-resident: Lieut.-Col. Sir A. Burnes, Kt.; Colonel C. Ovans; Major J. Holland; J. Bird, Esq.; Captain R. Shortrede; Captain J. Carles, I.N.; Major H. Rawlinson; and Captain W. C. Harris.

The following gentlemen are elected Members of the Society :—

Lieut. G. Munbee, proposed by Colonel T. Dickinson, seconded by Captain G. Fulljames; Dr J. M'Lennan, proposed by Dr J. Burnes, K.H., and seconded by Dr C. Morehead.

Read a letter from the Secretary of the Bombay Branch of the Royal Asiatic Society, announcing the project of establishing a Museum, and requesting the contribution of objects of Natural History and funds from this Society in aid of the proposed establishment; also forwarding a copy of the rules of the Museum.

* *Vide* Statement No. 1.

Resolved, "That the collection now in the possession of the Society be made over to the Museum, and that the Committee be informed, that any objects which may hereafter be presented to the Society shall in like manner be contributed; but that we are unable to afford pecuniary aid."

The following papers were then laid before the meeting:—

1. Report on Adam's Bridge . . .	By Lieut. Christopher, I.N.
2. Description of the Temple of Ramiseram, with Plan, by Lieut. Christopher, I.N.	Communicated by the Author.
3. Vocabulary of the Koolbe Language, (in Guzerattee)	Collected by Captain Fulljames.

LIBRARY DONATIONS.

Report of the General Committee of Public Instruction, dated the 30th October last; with the Minute of the Right Honourable the Governor-General .	Presented by Government.
1st Vol. Progress of Maritime Discovery, by James S. Clarke	Lieut. Ethersey.
Four Vols. Travels in Northern Greece, by Lieut.-Col. W. M. Leake . .	The Author.
Madras Journal of Literature and Science, from Nos. 1 to 28 . . .	Madras Literary Society.
Note of a March from Brimham Ghat on the Nerbudda to Umurkuntuck, the source of that River, by George Spilsbury, Esq. Five Copies . . .	Forwarded from Bengal.
Extrait du Rapport Annuel fait à la Société de Géographie de Paris, pour le année 1839 (Collection Géographique de la Bibliothèque Royale) . .	Geographical Society of Paris.
Notes sur les Gallus de Lemmon, par M. Jomard. Notation Hypsometriques, ou Nouvelle Manière de Noter les Altitudes, par M. Jomard, Membre de l'Institut	M. Jomard, President Geographical Society of Paris, Member of the French Institution.

At the Quarterly Meeting of this Society, held in the Society's Room, Town Hall, on Thursday the 5th August 1841—

PRESENT—Colonel T. Dickinson, Vice-President, in the chair; Rev. W. K. Fletcher; R. H. Kennedy, Esq.; Dr J. Burnes, K.H.; Captain John Fulljames; John Macleod, Esq.; A. B. Orlebar, Esq.; J. G. Malcolmson, Esq., M.D.; J. J. Waterston, Esq., N.I.I.N.; Ball Gungadhur Shastree; and J. F. Heddle, Esq., Secretary.

Minutes of the Anniversary Meeting held on the 6th May 1841 are read and approved.

Dr B. P. Rooke is elected Member of the Society—proposed by Captain G. Fulljames; seconded by the Secretary.

Papers were then laid before the meeting.

PAPERS.—Report on the Soda Soil of the Barramahal, by Captain J. Campbell	Presented by Government.
Comparison of the Route of Isidorus of Charax from Seleucia to Atrobatana	G. Masson, Esq.

LIBRARY DONATIONS.

MAPS.—Survey of the Island of Oorim, commonly called Caranjah Island, by Lieut. Lendrum	Major T. B. Jervis.
Survey of Scinde, part of Beloochistan, and Affghanistan principally, by the Quarter-Master-General's department, and showing the routes marched by the Bombay Division of the Army of the Indus, from the mouth of the Indus to and from Cabool, in the years 1838-39-40 .	Lieut.-Colonel N. Campbell, with the vouchers of Government.
A View of the Evidence given before a Select Committee of the House of Commons on a petition from the East India Company. 2 copies .	Government.
Travels from St Petersburg in Russia, to various parts of Asia, by John Bell. 2 vols.	J. M'Adam, Esq.
Essay on the Productive Resources of India, by J. F. Royle, M.D. . .	Government.
Hakluyt's Voyages. 2 vols. . .	Rev. W. K. Fletcher.

At a Quarterly Meeting of the Society, held in the Society's Room, Town Hall, on Thursday the 11th November 1841—

PRESENT—Colonel T. Dickinson, Vice-President, in the chair; C. Morehead, Esq., M.D.; Major T. B. Jervis, F.R.S.; Rev. W. K. Fletcher; G. Buist, Esq.; and J. F. Heddle, Esq., Secretary.

Minutes of the Quarterly Meeting held on the 5th August 1841 are read and approved.

H. B. Riddell, Esq., Bengal C. S., is elected Member of the Society—proposed by Major Jervis, and seconded by Colonel Dickinson.

The following resolution was carried :—

Moved by Colonel Dickinson, seconded by the Secretary, " That the best thanks of this Society are due to Major T. B. Jervis, Engineers, for his unceasing and zealous advancement of geographical science in India, and particularly for his exertions on behalf of the Society, in promoting its object by extending its influence and contributing many valuable donations."

Read a letter of the Secretary to the Government of India, dated

16th August 1841, intimating that the works applied for by the Society, viz., Boilean's Rajwara, and Pemberton's North-east Frontier, including Munnipore, had been despatched by dawk bhangy.

Papers were then laid before the meeting.

PAPERS.—Brief Historical, Geographical, and Statistical Memoir on Okhamemdab, by G. L. G. Jacob . .	Presented by Government.
Report on the Aurub River, Lake Mancher, and the River Narrah, by R. C. Knight, Esq., M.D. . . .	Government.
Givalior Nameh, or History of Givalior, translated from a Persian manuscript	Major T. B. Jervis, F.R.S.

LIBRARY DONATIONS.

History, Antiquities, Topography, and Statistics of Eastern India, &c., &c., collated from the original documents at the East India House, by M. Martin	Government.
Account of the Trigonometrical Survey of England and Wales, from the commencement in 1794 to 1796, by Captain W. Madge, F.R.S., and Mr Isaac Dulby	Major T. B. Jervis, F.R.S.
Humboldt's Personal Narrative, Humboldt's New Spain, and Vincent's Mearches	Professor Orlebar.
Journal of the Royal Geographical Society of London, vol. X., part 3d of 1841	The Royal Society.
MAPS.—Survey of the Island of Oorim, or Caranjah, by Lieut. Lendrum, in 1774. Survey of the country between Sirbohee and Deesa, including the Aboo Mountains, by Lieut. Neufville, in 1827	Government.

At the Quarterly Meeting of this Society, held in the Society's Room, Town Hall, on Thursday the 3d February 1842—

PRESENT—Colonel T. Dickinson, Vice-President, in the chair; Major W. Stirling; Dr C. Morehead; Lieut. G. Fulljames; John Macleod, Esq.; and J. F. Heddle, Esq., Secretary.

Minutes of the Quarterly Meeting held on the 11th November 1841 are read and approved.

The following gentlemen are elected Members of the Society :—

Lieut. J. S. Grieve, I.N., proposed by Lieut. Moutrion, I.N., seconded by the Secretary; H. Borradaile, Esq., C.S., proposed by Captain Fulljames, seconded by the Secretary.

Proposed by the President, and resolved unanimously—

"That the Society should take into its consideration in what manner

it can most appropriately mark its sense of the eminent services, in the cause of geographical discovery, rendered by the enterprising traveller the late Sir A. Burnes, Knight, in order to enable the Society to testify its respect for his memory."

Read a letter, dated Ankobar, 8th October 1841, from Assistant-Surgeon R. Kirk, attached to the Shoa mission, relative to the interesting proceedings of that expedition, and giving a few brief observations on the state of Abyssinia, and its field to the botanist and geologist.

Read a letter from H. Borradaile, Esq., dated Calcutta, 12th December 1841, requesting to be informed whether or not it is allowable for subscribers to the Society to compound for all past and future subscriptions, as recently proposed by Major T. B. Jervis.

Read a letter from the Hon. G. W. Anderson, Esq., Governor, to the address of Major Jervis, expressing the interest he feels in the advancement of the Geographical Society, and intimating his readiness to afford the Society all the aid in his power.

A Paper was then laid before the meeting.

Paper.—Outline of the Soumali Language, with Vocabulary, by Lieut. C. P. Rigby, 16th Regt., N.I.	Presented by the Secretary.

LIBRARY DONATIONS.

200 Copies of the Contributions to the Geography and Statistics of the Western Coast of India .	Major T. B. Jervis.
Astronomical Society's Proceedings, containing Major Jervis's Notice of Colonel Evnert's Labours	Do. Do.
Register of Maps of the Bengal, Madras, and Bombay Presidencies, in 2 vols.	Do. Do.
Rankine on the Pali Plague; Taylor's Topography of Decca; Butler's Topography of Oudh; Martin's Topography of Calcutta; Rankin's Topography of Sarem; Murray's Topography of Meerut; M'Cash's Topography of Assam; Dollar's Topography of Kemoon; M'Leod's Topography of Bishnath; Irwin's Topography of Ajmeer; and Hennel's Topography of Malta . . .	The Medical Board.
Journal of the Bombay Branch of the Royal Asiatic Society. Edited by the Secretary in the month of October 1841. No. 2 . .	The Asiatic Society.

Journal Asiatique; ou, Recueil de Mémoires, tome 11, in 5 copies; Bulletin de la Société de Géographie, tome 13, 14, and 15 .	The Paris Asiatic Society.
MAP.—Map of the Tannah Collectorate or Northern Concan .	Major T. B. Jervis.

Harris's Wild Sports, bought by the Society for 50 rupees from Forbes & Co., in two books.

A Special Meeting of this Society (called for the purpose of devising some means of evincing their respect for the memory of the late Dr Heddle) held in the Society's Room, Town Hall, on Thursday the 17th March 1842—

PRESENT—Captain D. Ross, President, in the chair; Captain R. Oliver, R.N.; J. S. Willoughby, Esq.; Dr J. Burnes, K.H.; Colonel C. T. Dickinson; W. C. Bruce, Esq.; Lieut.-Colonel N. Campbell; Dr C. Morehead; Rev. W. K. Fletcher; A. Spens, Esq., C.S.; Dr J. Glen; W. Baxter, Esq.; Lieut. W. S. Suart, Engineers; Dr R. Brown; Cursetjee Jamsetjee, Esq.; J. G. Malcolmson, Esq., M.D.; and G. Buist, Esq., Acting Secretary.

Read a letter from Mr Fawcett, apologising for his absence, (he having left for the hills,) but expressing his cordial concurrence in the objects of the meeting. Apologies were also read from the Rev. Dr Wilson, and from Drs M'Adam, Kennedy, and Shippe, strongly expressive of their admiration of Dr Heddle's merits. A letter was read from the Agri-Horticultural Society, expressing the anxiety of their Association, of which the late Dr Heddle was also Secretary, to be permitted to take a share in the proceedings of the present meeting. This wish having been at once acceded to, it was agreed that the present should be considered a joint meeting of both Societies.

The President having explained the object of the present meeting, the following resolution was proposed by Colonel T. Dickinson, and read from the chair:—

Resolved—"That, to mark the deep sense of the loss which the Geographical Society of Bombay, and the Agricultural and Horticultural Society of Western India have sustained by the premature death of Dr Heddle, to whose superior acquirements, enlightened views, and unwearied exertions in furtherance of their important objects, these institutions in a great measure owe their original formation, and the reputation and success which have hitherto attended them—a subscription be entered into for the erection of a Tablet in the Cathedral or Byculla Church, with an inscription commemorative of their respect for his memory, and their feeling of gratitude for the important services rendered by him to the cause of geographical discovery, and for the promotion of agricultural improvement in India; and that 150 Rs. be contributed out of the funds of each Society towards this object."

The above having been seconded by Dr Burnes, K.H., and unanimously agreed to, Colonel Dickinson proceeded to observe,—That the

task of doing anything like justice to the merits of the most estimable and highly-gifted individual, to pay homage to whose memory the two societies, of which he was the chief ornament, had this day united, was one, to the performance of which he felt himself wholly incompetent—a circumstance the less to be regretted, from their being so well known and appreciated by the whole of the gentlemen by whom he had the honour of being surrounded. To compensate, however, for the disadvantages in this respect under which he laboured, he would, after throwing himself upon the forgiveness of the writer, read from a letter, which he had received since entering the room, a passage not less feelingly than felicitously portraying the varied excellences for which our lamented Secretary was distinguished, and the eminent claims which he had established, as a man of science and philanthropist, to lasting remembrance. This letter was from the learned President of the Asiatic Society, also a member of the Agricultural and Horticultural Society, who, by more pressing engagements and slight indisposition, has been deprived of the satisfaction of giving his personal aid on this occasion. It is as follows :—

"Your proposal to hold a joint meeting of the different Societies of which the late lamented Dr Heddle was connected, for the purpose of devising some suitable method for the preservation of his memory in this place, is one which will doubtless meet with universal approbation. The obligations of these institutions to the distinguished member and office-bearer whose loss is deplored, are of no common kind; for their success and usefulness are greatly to be attributed to the zeal and ability with which he supported their interests, and directed their proceedings, and co-operated in their practical endeavours to extend the boundaries of geographical knowledge, and to call forth the agricultural and commercial resources of this country. His talents were of a high order, and they were united with that acuteness and delicacy of observation, and patience of application and research, which were indispensable to real eminence. His professional attainments were such as reflected honour upon himself and the service to which he belonged. He took an extended view of his relations to the community in general; and he was ever ready to lend a helping hand to those who were engaged in pursuits which he conceived calculated to advance its interests. There is every reason to believe that his health was sacrificed to his numerous engagements in, directly and indirectly, promoting the public welfare; and it would be to the shame of our presidency if his remembrance were suffered to pass away, and his example were unheeded."

Colonel Dickinson would not, by further observations, weaken the impression which this justly-merited tribute of respect was calculated to leave on the minds of the meeting. He concluded by moving that Dr Morehead, Lieut. Suart of the Engineers, and Cursetjee Jamsetjee, Esq., be nominated as a Committee to carry the wishes of the Society into effect.

At the request of the meeting, Mr Buist consented to officiate as Secretary to the Society till the next annual meeting, when the regular election of office-bearers takes place.

At the Anniversary Meeting held in the Society's Room, Town Hall, on Thursday the 5th May 1842 :—

PRESENT—Captain D. Ross, I.N., F.R.S., President, in the chair; Captain R. Oliver, R.N.; Dr J. Burnes, K.H.; Dr R. Brown; Dr J. Glen; Dr C. Morehead; Dr B. P. Rooke; J. G. Malcolmson, Esq., M.D.; W. H. Harrison, Esq.; R. W. Crawford, Esq.; Manockjee Cursetjee, Esq.; Ball Gungadhur Shastree, Esq.; and G. Buist, Esq., Secretary.

Read and approved the minutes of the Quarterly Meeting held on the 3d February 1842, and likewise the minutes of the Special Meeting held on the 17th of March 1842. The Committee on the Heddle Testimonial reported Rs. 2800 had been subscribed, and 2100 already paid up, for the purpose of erecting a memorial to the late Dr Heddle, and that they now waited for answers from London to applications which had been made by the steamer of 1st April, for plans, drawings, and estimates of such a monument as might be desired. The proposition brought by Col. Dickinson before the meeting of the 3d February, in reference to the best method of manifesting the Society's respect for the memory of the late Sir Alexander Burnes, having been read, it was unanimously agreed that this should be taken into consideration at a special meeting directed to be convened so soon as official intimation was received of the death of that officer. No notice of this event having been received from any accredited quarter by Government, and no promotion having taken place in consequence, although no doubt whatever remained of the fact, it was considered premature to adopt any further measure for the present. It was stated that the Bombay army were understood to wait on similar grounds to make a general demonstration on the subject. The following gentlemen were elected members of the Society :—

1*st.* Lieut. W. E. Evans, 1st European Regt., and Assistant-Superintendent of Revenue Survey, Poona. Proposed by Lieut. A. Nash, and seconded by Mr Secretary Buist.

2*d.* John Drewer, Esq., Assistant-Surgeon, Madras Presidency. Proposed by Dr J. Burnes, K.H., and seconded by Dr J. Glen.

3*d.* C. C. Jacob Craberg of Hemso. Proposed by Manockjee Cursetjee, Esq., and seconded by Mr Secretary Buist.

The following donations were presented :—

By Government : A Memoir, containing some highly interesting information relative to the existence, in Eastern Africa, north of the equator, of a vast navigable river, termed the Gochob, and the countries

adjacent thereto, from native information collected in the kingdom of Shoa. By Captain W. C. Harris, of the Bombay Engineers; with a letter, dated 24th March 1842.

Books.—Suggestions received by the Agricultural and Horticultural Society of India for extending the cultivation and introduction of useful and ornamental plants, with a view to the improvement of the agricultural and commercial resources of India. Compiled by H. H. Spry, M.D., F.R.S., F.G.S., Secretary Agri-Horticultural Society of India; with a letter, dated 24th February 1842.

By Government: Report on the Khalsa villages of Ajmere. By Lieutenant-Colonel Sutherland; with a letter, dated 4th March 1842.

By the Secretary: Paper—Some account of the Koree, or Eastern Branch of the Indus. By B. A. R. Nicholson, Esq., Civil Surgeon; with a letter, dated Rajcote, 19th April 1842.

By Manockjee Cursetjee, Esq.: Two Books—Specchir Geografico, e Statistico dell' impero de Maroco del Cavaliere Conte, Jacopo Graberg de Hemso, &c., &c. Dell' Ultimi Progressi della Geografico Sunto letto Vel conte Cavaliere, Jacopo Graberg de Hemso, &c., &c.; with a letter, dated Florence, 12th February 1842.

The thanks of the Society were directed to be returned to the respective donors by the Secretary. A statement (*vide* Statement No. 2) of the finances of the Society having been read, was found highly satisfactory. The voting lists having been examined, the following gentlemen were found to have been elected office-bearers for the ensuing year:—

3 *Vice-Presidents*:—Captain R. Oliver, R.N.; J. P. Willoughby, Esq.; and Colonel T. Dickinson. 12 *Resident Members*:—Dr C. Morehead; Dr J. Burnes, K.H.; G. Buist, Esq.; Dr K. Brown; J. G. Malcolmson, Esq., M.D.; Lieut.-Colonel N. Campbell; W. C. Bruce, Esq.; Captain E. P. Del Hoste; Dr R. H. Kennedy; Dr J. Glen; Dr J. M'Adam; and George Giberne, Esq. *Non-Resident Members*:—Major H. Rawlinson; Captain W. C. Harris; Colonel C. Ovans; Dr J. Bird; Captain R. Shortrede; Major J. Holland; Captain G. L. Jacob; and Lieut. H. A. Ormsby, I.N., F.R.S.

Mr Buist, who had been elected Acting Secretary on a former occasion, was now elected permanent Secretary for the Society. This having occasioned a blank in the Committee, of which the Secretary is member *ex officio*, the name of Assistant-Professor Ball Gungadhur Shastree was found to stand next in the Voting List to those already named, and was accordingly declared member of the Committee. The specimens of iron ore presented by Mr Elphinstone, together with the letters which accompanied them, were, in terms of the resolution of the General Annual Meeting of May 1841, made over to the Museum of the Bombay Branch Royal Asiatic Society. It was suggested that Captain Ross should be requested to place in the hands of the Com-

mittee, for publication, the very extensive series of tidal observations recorded by him. To this the President agreed; stating, however, that as they fell greatly below his ideas of the standard of accuracy with which a register of the sort should be kept, this much would require to be explained to prevent error on their being published. No other business coming before the Society, the meeting adjourned to the first Thursday of August.

No. I.

STATEMENT OF THE BOMBAY GEOGRAPHICAL SOCIETY'S ACCOUNT,

From 1st May 1840 to 30th April 1841.

PAYMENTS.

1841.		R.	A.	P.
April 30.	To Printing	401	0	8
	„ Establishment	276	0	0
	„ Contingent Expenses	128	4	6
		805	12	6
	„ Balance	1801	9	1
	„ Deduct amount of this year's subscriptions included in the Society's balance in Treasurer's hand on the 31st July 1840	150	0	0
	„ Balance in favour of the Society at this date	1651	9	1
		2607	5	7

RECEIPTS.

1840.		R.	A.	P.
July 31.	By Balance in the hands of the Treasurer at this date	1058	9	7
1841.				
April 30.	„ Amount of Government subscriptions for 12 months, at Rs. 50 per month	600	0	0
	„ Do. subscriptions of Members for 1840-41	870	0	0
	„ Do. Captain Harris's donation to Library Fund	50	0	0
	„ Do. Journal Royal Geographical Society, sold	12	12	0
	„ Do. of this Society's Proceedings, sold	16	0	0
		2607	5	7

BOMBAY, 30*th April* 1841.

(Signed) J. F. HEDDLE, *Secretary.*

No. II.

STATEMENT OF THE BOMBAY GEOGRAPHICAL SOCIETY'S ACCOUNT,

From 1st May 1841 to 30th April 1842.

1842.	DISBURSEMENTS.	R.	A.	P.
April 30.	To Printing	1324	14	6
	„ Establishment	355	3	8
	„ Contingent Expenses . .	118	7	2
	„ Subscription to the late Secretary Heddle's Monument . .	150	0	0
		1948	9	4
	„ Balance in favour of the Society at this date	1622	6	9
		3571	0	1

1841.	RECEIPTS.	R.	A.	P.
July 31.	By Balance in the hands of the Treasurer at this date . . .	1565	14	6
1842.				
April 30.	„ Amount of Government Subscriptions for 12 months, at Rs. 50 per month	600	0	0
	„ Do. subscriptions of Members for this year	1379	0	0
	„ Do. of the Society's Proceedings sold by Messrs Collett & Co. .	11	1	7
	„ Do. of Journal of the Royal Geographical Society sold . .	15	0	0
		3571	0	1

BOMBAY, 30*th April* 1842.

(Signed) GEO. BUIST, *Secretary.*

Observations during a Voyage of Research on the East Coast of Africa, from Cape Guardafui south to the Island of Zanzibar, in the H. C.'s cruisers Ternate, (Capt. T. Smee,) and Sylph schooner, (Lieut. Hardy.)

January 2d, Wednesday.—Sailed from Bombay in company with our consort the *Sylph* schooner, (Lieut. Hardy,) having under convoy two merchant vessels bound to Mocha.

3d, Thursday.—Spoke Lieut. Hardy, who informed us his chronometer had unfortunately stopped; at noon, the thermometer in the shade stood at 79 deg.; lat. observed, 18 deg. 16 min. N.; long. 71 deg. 36 min. E.; wind, fresh from N.N.E., with fair weather.

4th, Friday.—We had fine weather, with a light north-easterly wind. Our thermometer, which had been fixed in the companion-hatch of the gun-room, was yesterday in the evening removed to a more exposed situation to the captain's cabin on deck. At noon to-day, observed it had fallen to 78 deg., being one degree lower than yesterday. Lat. 17 deg. 48 min. W.; long. 69 deg. 47 min. E.

5th, Saturday.—During the preceding night a heavy dew had fallen, but the air to-day felt pleasantly dry and cool. Thermometer 77½ deg.; lat. 17 deg. 29 min. N.; long. 68. deg. 46 min. E.

6th, Sunday.—We were in lat. 16 deg. N.; long. 66 deg. 45 min. E.; thermometer stationary at 77½ deg.

7th, Monday.—In lat. 16 deg. 13 min. E.; long. 64 deg. 29 min. E. The thermometer at 76 deg.; light winds from the N.E., with cool weather.

8th, Tuesday.—The weather still continued delightful with a pleasant north-easterly breeze. The thermometer at 75 deg.; lat. to-day at noon 15 deg. 44 min. N.; long., per chronometer, 62 deg. 30 min. E.; by a lunar observation, taken at 8 P.M., 61 deg. 53 min.; variation of the compass per azimuth, 52 miles west.

9th, Wednesday.—In lat. 15 deg. 32 min.; long. by chronometer, 60 deg. 45 min. E., and by a lunar taken at 8 P.M., 60 deg. 55 sec. No alteration in the state of the winds or weather, and the thermometer remained at 75 deg.

10th, Thursday.—In lat. 15 deg. 2 min. N.; long. per chronometer, 58 deg. 54 min. E.; at 8 P.M., by lunar, 58 deg. 27 min. E.; thermometer 76 deg.

11th, Friday.—Lat. 14 deg. 40 min.; long. per chronometer, 47 deg. 11 min. E.; and by lunar, at 8 P.M. 56 deg. 20 min. The thermometer at 77 deg.

12th, Saturday.—We parted with the convoy, and changing our course from W. to S.S.W., steered towards the island of Socotra. At noon observed an immense shoal of porpoises about half a mile astern of us, passing with great velocity, in a direction from the N. to the S.E. In the evening a rank smell of fish spawn

was strongly perceptible. Thermometer, at noon, 77½ deg.; lat. 14 deg. 35 min. N.; long. by chronometer, 55 deg. 37 min. E. The wind from the east, with fine weather, and a cloudy sky. About sunset, the appearance of what seemed to be land, in the west part of the horizon, produced considerable alarm, which was soon dissipated, on observing that the clouds, which caused this strange and remarkable deception, began to alter their forms.

13*th*, *Sunday*.—At 5 P.M., steering south-west, we had a view of the island of Socotra* through the haze, bearing W. by S. ¼ S., distant 10 or 12 leagues. Stood towards it, with an intention of nearing the shore before daylight next morning, in order that we might have an opportunity of ascertaining the position of the easternmost point of the island; but the *Sylph* making the signal that she had struck soundings, we hove to for the remainder of the night. Thermometer 78 deg.; lat. 13 deg. 13 min. N.; long. 55 deg. 11 min. 15 sec. E.

14*th*, *Monday*.—We sounded, but found no ground with a line of 80 fathoms. Made sail again at daybreak, and steering W. by S., coasted along the south side of the island about 15 miles from the shore. Lat. 12 deg. 27 min. N.; long. by chronometer, at noon, 54 deg. 57 min. E. At 2 P.M., the eastern extremity of Socotra bore N. by W., and, according to our observations, is situated in lat. 12 deg. 34 min. N.; in long., from the chronometer at noon, 45 deg. 45 min. 38 sec. E.

15*th*, *Tuesday*.—Continued our course along-shore, in from 18 to 27 fathoms, over a bottom of red coral. Socotra, towards the south, presents an appearance extremely dreary; its arid rocks seemed destitute of trees or verdure of any kind, at least none were visible to us, though frequently examined through our best glasses at only a few miles' distance. On approaching it from the east, land showed in the form of a high promontory, termed by navigators the Dolphin's Nose. As we brought the south cape of the island abreast of us, an extensive rocky precipice of considerable height, and remarkable for its uniformity in this respect, approaching close to the water's edge, concealed the land in the interior, and appeared to occupy the whole centre of the island, the land at each

* Socotra, or Socotora, so well known for the production of the drug aloes, is in most charts, except Horsburgh's, laid down too far to the westward. It bears E. by N. of Cape Guardafui 138 miles, the latter being in longitude 51 deg. 13 min. E., and the western extremity of Socotra in long. 53 deg. 26 min., and lat. 12 deg. 24 min. N. It has several good harbours and anchoring places, the best of which is said to be Tivee, on the north-east side of the island, where water is easily procured. Between it and Cape Guardafui are situated the Isles of Sumhaa and Duraga, or, as we name them, the Brothers, and Adulcasia, all of which are also placed too much to the westward in the charts. The last-mentioned island is said to afford plenty of excellent fresh water; it is inhabited by Arabs, who are subject to the chief of Socotra. Socotra is governed by an Arab sheik. The produce of the island being insufficient to support the population, the ports of Arabia furnish it with grain, &c. &c. I believe aloes, fish, and salt are the only articles it produces. The inhabitants are chiefly Arabs.

extremity terminating in irregular mountains, some of which, on the east, are of a good height. We ascertained the position of the south cape or headland to be in lat. 12 deg. 20 min. N., long. 53 deg. 37 min. E.; and that of the western extremity, as far as visible, in lat. 12 deg. 24 min. N., long. 53 deg. 26 min. E. Continuing to steer W. by S., we saw the two small square isles, called by the English the Brothers, bearing about 50 miles W.S.W. of the south cape of Socotra. The eastern one, named by the Arabs Duraga, or Degree Island, is situated, according to our observation, in lat. 12 deg. 7 min. N., long. 53 deg. 26 min. E.; from the east it has very much the appearance of a castle or citadel. The other, called Sumhaa, is about 8 or 10 miles west of Duraja, has a remarkable rocky process on one end, bearing a striking resemblance to a sentry-box or watch-tower. Its position is in lat. 20 deg. 8 min. N., long. 53 deg. 18 min. E. The weather still fine, with a cloudy sky, the thermometer at 76½; lat. to-day at noon, 12 deg. 2 min. N.; long. per chronometer, 53 deg. 30 min. E.

16*th*, *Wednesday*.—Pursuing our course W. and by S., we at noon passed the island of Abdulcuria, the disjointed rocks of which appeared at a distance like so many separate isles. It extends in a N.W. and N.E. direction, and bears, from the south cape of Socotra W. by S. 100 miles, and 50 miles W. ½ S. of the Brothers; the island is an appendage of Socotra, to the chief of which it is subject; it is said to afford plenty of excellent fresh water. Passing this island, the high land on the eastern extremity of the African continent presented itself to our view, and at 9 P.M. we hove-to, with the ship's head to the S.E. —Cape Guardafui bearing W. by N. ½ N., distant 9 or 10 leagues. We were still favoured with fine cool weather; the thermometer at 77 deg., with light winds varying from N.E. to E. and S.E., and the sky generally overspread with light-coloured clouds; with the exception of the night of the 5th, no dew has fallen since we sailed. Lat. at noon 11 deg. 49 min. N.; long. by chronometer 52 deg. 13 min. E.; variation by azimuth 5 deg. 31 min. W.; the position of Abdulcuria, according to our observations, is in north lat. 12 deg., and long. 52 deg. 20 min. E.

17*th*, *Thursday*.—At sun-rise made sail again, steering in a S.W. direction along the continent of Africa, in from 35 to 70 fathoms,—white sand and coral; but about 4 P.M. it falling calm, and finding a current setting us in-shore at the rate of half a mile an hour, came to in 38 fathoms, to prevent ourselves being imbayed. At 6, a breeze springing up from the eastward, encouraged us to make another attempt, but presently dying away, we were again obliged to anchor. While lying here we put out our lines and caught one fine rock-fish, which are probably very plenty, as we observed our consort the *Sylph* haul up several in a short space of time. At 10 P.M. weighed, with a light easterly wind, and stood to the S.E. We had this day cloudy weather, with light variable winds; the thermometer at 78½ deg. Lat. 11 deg. 41 min. N.; long. per chronometer at noon, 51 deg. 14 min. E.

According to us, Cape Guardafui is in north lat. 11 deg. 49 min.; long. 51 deg. 13 min. E.

18*th, Friday.*—Working off shore with light baffling winds, in from 45 to 55 fathoms, sand. The weather cloudy, with slight showers of rain and a lowering sky. A considerable dew had fallen during the night, and the air to-day felt damp and unpleasant. The thermometer at 78½ deg.; found the current setting us in shore at the rate of one mile per hour. Lat. 11 deg. 30 min. N.; long. by chronometer at noon, 51 deg. 31 min. 15 sec. E.

19*th, Saturday.*—Dew at night; and during the day southerly winds continued to prevail, with damp cloudy weather, and occasional showers of rain; the thermometer at 78½ deg. Tacking off and on shore, we had in the course of the day another sight of the island of Abdulcuria and the Brothers, the former bearing N.W. of us, and the latter in a north-easterly direction. Lat. observed, 11 deg. 42 min. N.; long. by lunar at 9 A.M., 51 deg. 56 min., and by chronometer at noon, 52 deg. 5 min. E.; variation by azimuth, 7 deg. W. About 6 P.M., in attempting to tack, the ship refused to stay, and in consequence got foul of the *Sylph*, which we at the time had in tow. Fortunately, however, after some alarm and a little trouble, we soon got clear again, without material damage being sustained by either vessel.

20*th, Sunday.*—Continued working along the African shore, with fresh southerly winds; the thermometer at 79½ deg.; Cape Guardafui and the Brothers still in sight. Abdulcuria at sunset bore N. and by E. of us, distant 14 or 15 leagues. Lat. 11 deg. 27 min. N.; long. per lunar at 9 A.M., 52 deg. 24 min. E., and by chron. at noon, 52 deg. 29 min. E.; variation per azimuth, 6½ deg. W.

21*st, Monday.*—Still working against the southerly winds; no land in sight. The thermometer at 79½ deg. Lat. observed at noon, 10 deg. 50 min. N.; long. by lunar at 10 A.M., 52 deg. 37 min.; and by chron. at noon, 52 deg. 43 min. E.; variation, 8 deg. 20 min. W.

22*d, Tuesday.*—During the early part of the day fresh southerly winds, with the thermometer at 79½ deg. Towards the evening it fell calm, when we lowered the boat and tried the current; found it setting to the northward at the rate of half a knot an hour. Lat. observed, 10 deg. 43 min. N.

23*d, Wednesday.*—We had light southerly winds and calm in the morning; but a northerly breeze springing up in the afternoon, permitted us to lay our course S.W. Still no land to be seen; the thermometer at 79½ deg. Lat. observed, 10 deg. 28 min. N.; long. by chron., 53 deg. E.

24*th, Thursday.*—Steering W.S.W., with a fresh northerly breeze. The weather damp and misty, and frequent drizzling rain. Thermometer 78½ deg. Lat. observed, 9 deg. 8 min. N.; long. by chron. 51 deg. 55 min. 15 sec. E.

25*th, Friday.*—Proceeding westward, we in course of the forenoon saw land, which, as we now approached that part of the coast where

the objects of our investigation lay, was looked to with anxious expectation. It bore N.W. by W., distant from us 5 or 6 leagues, and by the situation of the ship, knew it to be the land between Cape Orfui and Cape Basseos: as this coast has been hitherto considered as desert and inaccessible, we were anxious to examine it; but the thick haze which hung over the land, and the light winds and currents which we never failed to experience on nearing the shore, obliged us to heave off towards the evening to avoid getting imbayed; the land, as it appeared to us, seemed fully to justify the descriptions given of it. It seemed of a moderate uniform height, and barren and sandy, without vestige of habitation or vegetable production of any kind. We hove-to for a short time in the afternoon, and discovered, by striking soundings in thirty fathoms, and suddenly deepening again, that we had happened on a sandbank, many of which probably lay along this coast. While we lay to, the lines were put overboard, and shark and rockfish of various kinds being found in great plenty, a good number was soon taken, sufficient to furnish the whole ship's company with a fresh meal in the evening: made sail again, standing out from the land. We had to-day moderate north-easterly winds, with fair weather; the thermometer at 80 deg. Lat. observed, 8 deg. 20 min. N.; long. by chron. at noon, 50 deg. 32 min. E.; variation, 6 deg. 12 min. W. Immediately after discovering land, we perceived a large dow or boat close inshore, which appeared eager to avoid us.

26*th*, *Saturday*.—At daylight we could see nothing either of the boat or land, having lost sight of both during the night. Standing in, we again saw the coast about 7 in the morning. Its appearance was similar to what we sailed along the preceding day, only it was more flat and considerably lower, but equally barren. Kept our way along shore at the distance of about 6 or 8 miles, in from 10 to 25 fathoms, sand and shells. A little before sunset we hove to in 25 fathoms, and were again very successful in fishing. At 6 P.M. made sail, still keeping a respectable distance from the shore. The weather clear and warm, with steady easterly winds; the thermometer at 79½ deg. Lat. 7 deg. 10 min. N.; long. per chron. 49 deg. 42 min. 30 sec. E.

27*th*, *Sunday*.—Continued our way along the coast 3 or 4 miles from the shore, in from 20 to 25 fathoms, sand and gravel, with a very strong current in our favour. The land opposite us to-day was low and even, and had somewhat a better appearance than any we had for some days before seen. Green spots were here and there observable, and we could distinguish on the shore several natives and a few cattle, but of what description we were not near enough to ascertain. Fish still continued to be caught in great abundance. About 3 P.M. saw higher land ahead, which we took to be Cape Bassas,* the position

* Since the 25th we had been steering along that part of the African continent known to the English by the name of Agan. It is in general a low even coast, and is justly represented as desert and barren. In passing along it, some natives were seen tending a few cattle on the shore; but there is reason to believe,

of which, though described to be a very dangerous place, had never been accurately laid down; we were therefore anxious to determine it, and to have an opportunity of doing so properly, kept working to windward, that we might not pass it during the night. Winds still easterly, with warm weather. The thermometer at 79½ deg. Lat. 5 deg. 37 min. N.; long. by lunar at 8 P.M. 49 deg. 20 min. E.; variation per amplitude, 8 deg. 40 min. W.

28*th*, *Monday*.—Passed the elevated land seen yesterday afternoon, and at 2 P.M. Cape Bassas was abreast of us, distant a few miles. The real situation of this cape we had some difficulty to determine; for the land along, low and smooth, had so much sameness in appearance, and that forming the cape itself so little remarkable from the rest, that had we not observed the coast to recede considerably on each side, making opposite to us an evident projection or headland, we should still have remained in great uncertainty respecting it. At 5 or 6 miles' distance from the shore struck soundings in 19 fathoms, hard ground; and we had still a strong current in our favour; but we observed little or no rippling about the ship. The position of the cape,* according to the mean of several good observations, is in N. lat. 4 deg. 44 min., and long. 48 deg. 17 min. E.; variation per azimuth 9 deg. 7 min. W. After ascertaining the situation of this cape, we stood to windward during the night. To-day the weather continued fine, with a moderate easterly wind; the thermometer at 78 deg. Lat. observed at noon, 4 deg. 59 min. N.

29*th*, *Tuesday*.—Stood in again, and steered along the coast to the southward of Cape Bassas, at the distance of three miles, in from 10 to 20 fathoms, sand and shells. The land here was white and sandy; but in several places there was apparently tolerable pasturage ground, on which were seen several small groups of huts, and some pretty numerous herds of cattle. By the number of people observed on these spots, this tract seemed better frequented; but its general appearance was similar with that to the northward of the cape. During the preceding night a considerable dew had fallen, and the weather to-day was damp and cloudy; the thermometer at 78½ deg. As the supposed site of the river Doara† was near at hand, the examination of which

from the apparent extreme infertility of the sand, that the number of inhabitants can be but very small; even the sea-shore, where the abundance of fish would render the means of subsistence so easy to be attained, seemed totally neglected; not a hut or boat of any kind was to be seen throughout its whole extent—a strong proof of the thinness of population, and of the country near the coast being destitute of the material requisite for constructing these necessaries. The few inhabitants probably belong to the Saumalie tribe, whose limits of residence are said to extend to the line. We did not remark any inlets or traces of rivers on this coast.

* A little north of Cape Bassas is a hill or long ridge, of an uncommon red colour, and along the land from it to the cape itself are a number of white sand hillocks, which form excellent marks to vessels approaching it from the northward and eastward.

† From the information afterwards received, the Doara seems to be an inconsiderable stream.

formed one of our principal objects, it became desirable to avoid passing any part of the coast in the night; but towards the evening the wind unfortunately began to blow very fresh, with a heavy swell, and being on bad holding ground, we were once more reluctantly compelled to work to windward. Lat. observed at noon, 4 deg. 14 min. N.; long. by lunar at 2 P.M., 47 deg. 42 min. E.; variation per azimuth, 9 deg. 15 min. W.

30th, Wednesday.—Continued steering S.W., about 2½ miles from the land, in from 7 to 10 fathoms, white sand and coral; the *Sylph* keeping her course half-way between us and the shore, in regular soundings of 6 and 7 fathoms. This day's sail presented the same barren prospect as the coast we had already traced; it was still low and sandy, remarkably white, and to all appearance completely desert; neither huts, people, nor cattle of any description to be observed. The shore was in many places rocky, and a high surf beat over it. At 2 P.M. breakers appeared ahead, distant less than two miles, and a little beyond them, low land, which seemed to be an island; to weather these it became necessary to haul off shore; and immediately after taking this precaution, the wind began again to blow exceedingly fresh, with a very heavy swell, which forced us to continue standing out to sea during the whole night. Weather still damp and cloudy; the thermometer at 79½. Lat. observed at noon, 3 deg. 30 min. N.; long. by chron., 47 deg. 25 min. E.

31st, Thursday.—The wind increased to a gale, and blew furiously during the whole day and following night, attended with a tremendous heavy swell, which prevented us from approaching the shore near enough to see anything distinctly; we could only remark that the land seemed to be higher than what we had lately seen. Weather still damp and cloudy, and the thermometer at 79 deg. Lat. observed at noon, 2 deg. 44 min. N.; long. by chronometer, 46 deg. 5 min. E.; variation by amplitude, 10 deg. W.

February 1st, Friday.—The wind moderating, we continued our course along the coast in very irregular soundings of from 10 to 65 fathoms, rocks and gravel. At 9 A.M. the mosques of Magadosho were seen bearing W.S.W., distant 9 or 10 miles. The late gale has therefore carried us far to the southward of the reported mouth of the Đoara —a mortifying circumstance, and to us a very severe disappointment, for we had promised ourselves much gratification in exploring that river,—so interesting, and at the same time so little known.* At noon, Magadosho bore W.N.W. of the ship two or three miles; here we sounded, but could find no ground with a line of 80 fathoms. The town, which is large and irregular, is situated on an uneven sandy piece of ground close to the beach; the land behind considerably lower than that on either side. The houses resemble those seen in the towns on the coasts of Arabia and Persia, and are apparently built of stones and mud, of a low, square form, with small doors and windows, and have

* See note, page 28.

all flat roofs. The most conspicuous objects are the mosques already mentioned; there are four of them; three of which are placed in the town, the other among some straggling buildings, a little to the northward. The land, both to the N.E. and S.W., is of a reddish colour, thickly covered with black spots, and upon them some low spreading trees, which have a very uncommon appearance. About 10 miles to the southward is a remarkable white sandy hill, which, with the red hills already mentioned, are excellent marks in approaching Magadosho. The sea-shore, immediately opposite the town, is sandy, and guarded by a reef, which, running from the rocks on the N.E. to the S.W. end of the town, extends to about a quarter of a mile from the beach; within, the anchorage is said to be excellent. To the S.W., as to the N.E., the shore is in many places low and rocky, forming what has been described as islands.* We were doubtful of this, but did not go near enough to ascertain. We observed a large village on the northernmost of these supposed islands, a few miles south of Magadosho. Having determined the position of the town, we were in hopes that we might at last be enabled to anchor and pursue at leisure the inquiries we proposed to make here, concerning some of the objects of our search, but our bad fortune continued to attend us, for the wind began again to blow very fresh, with an exceeding heavy swell setting towards the shore. Under these circumstances we did not think it prudent to trust ourselves at anchor in an open unprotected roadstead, with a reef of rocks under our lee; we therefore bore away along the coast to the S.W. of Magadosho till the evening, when we stood out to sea, and passed a night more tempestuous than any we had hitherto experienced. The weather still damp with heavy dews at night; the thermometer at 78 deg. Lat. observed at noon, 2 deg. 4 min. N.; long. by chronometer at noon, 45 deg. 46 min. E. According to us, Magadosho is situated in N. lat. 2 deg. 3 min., and in long. by chronometer, 42 deg. 43 min. E.

2*d*, *Saturday*.—Being driven from Magadosho the preceding night, we intended, if possible, to make Meeya or Maiea, a place laid down about 14 or 15 miles to the S.W. of Madagascar. At twilight, however, saw nothing of such a place, and were again forced to stand out to sea during the night, when we must have passed it; for at noon today we were off the town of Brava in N. lat. 1 deg. 11 min., and long. 44 deg. 9 min. E. This town is situated under some very high reddish land, spotted with black rocks, and has several small islands abreast of it at a very short distance from the shore, one of which, to the southward, opposite a white sandy patch of high ground, has a tower or lighthouse on it. The land between Magadosho and Brava is uniformly high, and has that remarkable reddish spotted appearance already so often described. Our bad fortune still persecuted us: we could not anchor here for the same reasons that had prevented us at Magadosho;

* We afterwards discovered these to be really islands, and the commencement of the chain which extends beyond Patta.

we therefore yielded to our fate, and again took refuge in a secure distance from the shore. The houses of Brava are similar to those of Magadosho. The weather continued unaltered, with the therm. at 80 deg.; lat. observed at noon, 1 deg. 14 min. N.

3*d*, *Sunday.*—At noon we were in lat. 0 deg. 5 min. N. The land is low and woody. Proceeded along shore, looking attentively for a river,* described to discharge itself hereabouts: our search proving fruitless, at sunset came to anchor about 3 or 4 miles from the shore in 12 fathoms, soft sand; the land abreast of the ship low, sandy, and rocky. Though the wind had much abated to-day, it still, however, blew fresh, with a considerable swell, and the weather continued damp, with dew at night. Therm. at 78½ deg. Lat. at noon, 0 deg. 5 min. N.; long. 43 deg. 11 min. E.

4*th*, *Monday.*—About midnight the *Sylph* parted from her anchor, got under weigh early in the morning, and at noon passed the river Dos Fuegos, or Rouges River, and Juba Irunjba, a village situated at its mouth, but at too great a distance to make any particular observations. The coast for a little north of this river to Patta is faced by one continued chain of islands, some of which are large and wooded,

* The opinion upon which the existence of this supposed river rests is founded on certain accounts transmitted some time ago to the Governor of Bombay by the late Captain David Seton, the Company's resident at Muscat. This communication states the information to have been obtained from some people of respectability in that place, who were well acquainted with the part of the African coast in question. The substance of this detail is as follows:—"That a river of immense extent, known to the natives in its neighbourhood by the appellation of the Neelo, (Nilo,) and said to have its source in common with the Egyptian river of that name, discharges itself into the Indian Ocean in about 0 deg. 5 min. N. lat.; near to its mouth it is called Govind Khala. That the length of its course is about three months' journey; and nine weeks' journey from the mouth stands a large city named Gunamma, up to which, the river being navigable, immense quantities of slaves, elephants' teeth, &c., are brought down within a short distance of Brava, to which (the river then taking a more southerly direction) these articles of merchandise are afterwards carried overland, and either disposed of there or sent to Zanzibar." This story, though sufficiently plausible, would of itself, considering the known credulity and extreme propensity to exaggeration prevalent among the natives of the East, be entitled to very little regard, did it not happen to receive some countenance from Herodotus, the Grecian historian, who says that when in Egypt he was told that a branch of the Nile, bearing the same name, took an easterly course, and was supposed to fall into the Indian Ocean somewhere on the coast of East Africa. These, taken together, were strong, but still left ample room to believe that the river called by the Portuguese Dos Fuegos, and known to us by the name of Rogues River, which disembogues itself in 0 deg. 17 min. S. lat., might eventually turn out to be the same with this African Nile,—22 miles, the difference between their supposed mouths, being an error which people such as those of Muscat, unaccustomed to make accurate observations, may easily be supposed to fall into. It may here be seen that the truth of this surmise respecting the identity of the two rivers has been clearly established; though it will hereafter appear, from the information received at Patta, that the source of this river, viz., Dos Fuegos, will still be found to agree with, and authenticate the reports and conjectures derived from the above authority,—and, at all events, cannot fail to render it an object of interest and curiosity to the civilised world in general.

others very small. These islands are sometimes connected by reefs of rocks, over which a high surf beats, and sandbanks surround them. The reefs run through their whole length, frequently extending a considerable way out to sea; in one place, about 20 miles south of Juba, even to 7 or 8 miles, opposite which is a remarkable high insulated rock, in-shore, appearing like a square tower; here also the reef stretches a long way out—perhaps 5 or 6 miles. Though there are no soundings close to the edge of this part of the bank, the water was remarked to have a very white colour, resembling that often seen at the mouths of the large rivers. The land on this part of the continent is in general moderately high, and almost universally covered with wood; the shore shelves to a smooth sandy beach, which is guarded by the islands and reefs noticed. Steady, moderate north-easterly winds, with fine weather, but damp, and dews at night. The therm. at 78½ deg.; lat. observed at noon, 0 deg. 24 min. S.

5th, Tuesday.—In course of the forenoon passed by a deep inlet, where some boats were riding at anchor, and at sunset were abreast of several large woody islands, supposed to be those immediately north of Patta; between 6 and 7 P.M. came-to in 12 fathoms, fine sand. That part of the coast of Africa stretching from the equator south, beyond our present anchorage, promises in its aspect something very interesting to the enterprising investigator. The numerous richly-clothed islands which line the shore, separated by beautiful and frequently spacious inlets, and bounded behind by a delightful continent, rich in all the charms of luxuriant vegetation, present to the eye a prospect extremely enchanting, and would seem to indicate a degree of natural wealth equal to the most favoured regions of the known globe. Nothing could form a more striking contrast with that in view than the barren coast to the eastward of Juba. Fine steady easterly breeze, with pleasant weather. It is worthy of remark, since in the latitudes on this coast near the line, a heavy dew had been observed to begin falling immediately after the sun went down, and continued till some time after its rise next morning; during the day the air felt very dry. Therm. at 79 deg.; lat. observed at noon, 1 deg. 32 min. S.; long. per chron. at noon, 41 deg. 59 min. E.; variation, 13 deg. W.

6th, Wednesday.—Weighed and worked to windward for the purpose of trying the current and to get clear of the land, to observe the latitude at noon; in a few tacks began to gain ground. It was, therefore, evident that the strong southerly current which runs along the coast during the N.E. monsoon had already begun to change its direction, though as yet it is probably only to be felt near the shore. At noon saw a large dow a few miles astern, standing to the southward. She seemed at first extremely cautious of approaching the ships, but seeing English colours, ventured within hail, and being informed who we were, acquired more confidence. We were informed they were from Muscat, bound to Mampasse; they said their shyness arose from the suspicion of our being French cruisers. They afterwards obligingly sent on

board two pilots to conduct the ships to anchorage near Patta. At sunset came-to in six fathoms, and abreast of some small isles at the south point of the island Guien, which forms the north side of the inlet adjoining to Peer Patta,* on which was observed a considerable town,† bearing from the ship about N.W. Fired a gun as a signal for a Patta pilot to carry us through the intricate channel to the inner anchorage. Wind still steady from the N.E., with fine weather. The thermometer at 79 deg. Latitude observed at noon 1 deg. 59 min. 6 sec.

7th, Thursday.—A boat with pilots arrived from Patta; got under weigh, and proceeded through the passage in four, five, and six fathoms, and at 11 A.M. came-to again in a very narrow part of it, leading between the N.E. point of the island of Peer Patta and an extensive sand-bank, dry at low water, which runs a long way out. All of these islands, namely, Peer Patta, Daw Patta, Mandra, &c., are faced with shoals and rocks that render the navigation very difficult, and should, with other considerations, deter trading vessels from frequenting this port. In the afternoon sent the small boat with our Hindostanee pilot to Patta to acquaint the Sooltan of our arrival, and intention of visiting him next day. Weather as heretofore. The position of this anchorage is in south lat. 2 deg. 4 min.; longitude by chronometer 41 deg. 14 min. 2 sec.; variation 14 deg. west.

TRANSACTIONS AT PATTA.

8th, Friday.—The boat that went yesterday to Patta returned this morning, having left behind Mallum Ali, the Hindostanee interpreter, a circumstance which (there being reason to believe his stay not voluntary) added to the reports of the boat's crew concerning the deportment of the natives on shore, did not tend to impress us with a favourable idea of their good intentions. We had already learned from the pilots and others who had visited us on board, that the place was distracted by civil dissensions; the Sultanship being claimed by two rival cousins, whose respective adherents, occupying the same town, occasioned by their contentions a continual scene of confusion: and we knew that any correspondence with one party under these circumstances would, by the other, be considered as evincing a disposition of hostility towards them. It therefore became a doubt to which of these savage competitors for royalty we ought to pay our respects; for though we never dreamt of ascertaining the question of right and wrong between them, it was of some importance to discover which party was strongest and best able to protect and assist us in the prosecution of our inquiries. But this was found impracticable; several partisans of both factions were indeed on board, but each endeavoured to make it appear that his own

* Or rather to the island on which Patta and Sicull stand, called Peer Patta.

† This town is by the natives called Humoo.

was the rightful and most powerful Sooltan. Had the boat's crew been able to tell whose hands Mallum Ali had fallen into, it would have settled the matter as to the person, whoever he might be, there must have been a necessity to pay court; but none of them could speak with certainty respecting him. Disappointed in obtaining satisfactory information concerning this point, it was nevertheless determined to persevere in the resolution of visiting Patta. Accordingly, about 11 A.M., Captain Smee, in company with Lieutenant Hardy, myself, and the pilots, carrying with us a present * for the Sooltan, left the ship in the large cutter, manned with Europeans. It was judged prudent to take arms, (though, to prevent misunderstanding, they remained concealed till compelled to produce them in our own defence.) We had scarcely got a mile from the ship when we were met by a boat belonging to Sooltan Hammed, with presents for Captain Smee, but finding him on his way to Patta, declined going any farther; the chief man and one of the sepoys came into the cutter, and their boat returned with us to town. This conduct appearing very suspicious, determined us to act cautiously, and avoid particularly giving any pretence for violence. After two hours' sail we arrived off Patta; it was then low water, and the cutter could not approach nearer to the shore than half a mile; we were therefore obliged to go separately into small canoes, which the negroes pushed through the mud to the beach. On landing, nobody appeared to receive or conduct us to the Sooltan—another suspicious circumstance that did not give us much encouragement. But had such been their design, we had already gone too far to return, for the cutter with all the Europeans and arms were at some distance, and we had no means of rejoining them. Those who landed were—Captain Smee, Lieutenant Hardy, and myself; the syrang, captain's servant, with the pilots and persons from the Sooltan's boat. Under the direction of these last, we walked from the landing-place, surrounded by a crowd of armed savages, to a large unshapely heap of mud, called the Palace of Sooltan Hammed, where we met with our interpreter, Mallum Ali. Having entered it through a wicket in a strong door or gate, we were conducted across a square court to a kind of open porch, used, it seems, as a place of public audience; in it were placed several low beds or couches with broken rattan bottoms, on one of which we were desired to sit down. They were excessively dirty, and looked as if they had been stolen from some native brother in India. Immediately to the left of the one in which we were seated, stood the Sooltan's seat or throne, being nothing more than a new wooden arm-chair, with a high back and some rude carving on it. On the ground before, a round piece of wood or stone, with a hole in the middle, supplied the place of a footstool; and around stood a crowd of naked men and boys, for all ranks and descriptions have, it seems, here free access to the presence of their sovereign. The Sooltan immediately entered, and holding out his hand to us severally, took ours, and put the back

* Amounting in value to better than Rs. 300.

of it to his mouth—a ceremony the natives reversed; they all kissed the back of his hand. He is in person of a middle stature, rather corpulent, and has an agreeable countenance; I imagined his age to be about 35. He was dressed in a long dirty yellowish-coloured gown, with a greasy turban on his head, and filthy loose slippers on his feet, and in the left hand carried a sabre, the handle of which was of black wood ornamented with gold and silver. Being seated, a tin goblet of sugar and water, the favourite beverage of the country, was handed to each, which having drunk, the presents, with the letters from Government, were delivered by Captain Smee, who complimented the Sooltan in the name of Mr Duncan and the Honourable Company. He returned the compliments, but did not at that time open the letters. A conversation afterwards ensued, in which the objects of the voyage were stated, with a request for all the information in his power respecting them; but he seemed dissatisfied with the explanation of our views, which he probably suspected concealed designs of a dangerous nature, and appeared to stand very much on the reserve. To our interrogations about the unfortunate Mr Park and his associates, he only answered, "How can I speak of the man. I never saw him." Regarding the rivers on the coast, he confessed Rogues River to be of immense extent, that its sources were far beyond his knowledge, commonly believed to be in Europe, or, as he expressed it, "in our country;" that a great number of slaves were brought down it to Brova; but as to the towns, state of the country, or people which dwell on its banks, he said he was totally ignorant. At my suggestion, it was proposed to introduce the vaccine or inoculation at Patta, with the means for which I was ready provided. The Sooltan asked if that was possible, for allowing I might be able to do such a thing, how could it be propagated so as to be of advantage? It was replied, that a sufficient number of persons might be easily instructed for the purpose; but he seemed to doubt the truth of this assertion, and treated the proposal with contemptuous neglect. Then rising, he abruptly withdrew. Thinking the audience at an end, we were about to retire, but it was intimated that we must walk into another apartment, whither they conducted us, the way to it leading through the opposite side of the court, and up a narrow mud staircase; this room was better furnished, but equally filthy and more gloomy than the former. The Sooltan soon followed us, and it presently appeared, if we did not pay a very high price for liberty to take leave of His Highness, we must consent to remain for a time much exceeding either our pleasure or convenience. Seating himself for a moment, and whispering to some of his attendants, he rose, and with them retired into an inner room, where Captain Smee was called, and remained separated from us during the rest of the conference, which lasted till near sunset. About 4 P.M., they all came out for a few minutes; and at this moment a lascar arrived from the boat, and told us the people had been fired upon, but that on showing their arms they desisted. This outrage (we had a flag of truce flying all the time) was taken no notice of.

The Sooltan laid it to the charge of his cousin's* party. His Highness, however, seemed perfectly ashamed of his own treatment of us, which was such as he did not care to make public, for he carried Captain Smee a second time into the private apartment, for the purpose, as we afterwards understood, of extorting a promise of money and other articles from him. Our feelings were at this moment very uncomfortable. It was easy to see some mischief was in hand, for the place where we sat, and the passages about it, were filled with armed men; those who before had none, going out and returning with spears, bows and arrows, &c. Near sunset, Captain Smee again came out, and without sitting down said he was going to the beach; we followed, and, though environed by an armed multitude, reached it without molestation. Finding the boat, by the rise of the tide, had got close in, we embarked with great satisfaction. When Captain Smee was first called out, the Sooltan required that he should supply them with 15 muskets, 10 pistols, 11 barrels of gunpowder, several parcels of flints, &c.; this demand was remonstrated against, on the ground that these articles belonged to the Company his masters, and if he parted with them he could not defend himself against his enemies,—two of whose vessels, they themselves had acknowledged, were at Zanzibar and Quailemane; but again reflecting he was entirely in their power, promised to comply with their requisitions as far as compatible with the safety of the ships under his command. They seemed satisfied; said the French vessels at Zanzibar and Quailemane were only small vessels trading for slaves, and for the time put an end to the conference; but encouraged by success, (for they seemed to place great confidence in the promise of an Englishman,) a second request for money to satisfy their soldiers was made, to which Captain Smee positively refused to accede. He told them he had no money to spare; asked if the letters he had delivered had been read; if so, that he was astonished they should make so unreasonable a demand. To this they returned an equivocating answer: first, they had not; then they had read them. Perceiving him anxious to take leave (for they evidently intended to protract the interview till it should be too late for the boat to get off,) they insisted on his staying to eat; said he had better stay all night, for there was not water enough for the boat to get to the ship. He said he would go and see; and, without giving time for deliberation, walked out, and fortunately got to the beach before the rabble without knew anything of the affair. Having got the two pilots into the cutter, and a sepoy belonging to the Sooltan's boat, who was still waiting on the beach, we put off, determining to keep him as a security for the safety of Mallum Ali, who remained behind to preserve a show of friendship with the Sooltan, and at midnight reached the ships much fatigued, and happy at having escaped so well.

* His cousin was at this moment held in confinement in a dungeon close to the residence of this cruel and usurping relation, for it seems Ben Baneeci had the prior claim to the Sultanship.

DESCRIPTION OF PATTA.

The town of Patta stands on a low square point between two salt-water creeks, surrounded with woods, chiefly cocoa-nut trees, and is composed of wretched mud buildings. No fruit except the cocoa-nut was met with, and it was found impossible to procure any fresh water. Their sheep, which are covered with hair instead of wool, and their goats, are excellent.* The inhabitants belong to the Souallie tribe, a people sprung from a mixture of the Galla negroes with the Arabs, &c. The flat nose and thick lips, so peculiarly distinctive of the African countenance, is generally observed among them, and sufficiently marks their original connexion with that race; the woolly covering of the head universally prevails; the colour of their skins varies from a reddish brown or tawny hue, like the Arabs, to nearly a deep black; in their dispositions they are cunning and treacherous to the last degree.

On the 9th, the same boat we met yesterday, and which returned with us to town, arrived at the ships with presents from the Sooltan, consisting of 60 cocoa-nuts, 3 white bullocks, and 3 goats, in charge of one of his principal men, who came to receive the articles, the promise of which had been extorted during the interview at Patta. To give no cause for quarrel, the Sooltan's present was accepted, but the boat was sent back with an answer, that until Mallum Ali should be sent on board not a single article would be parted with. The pilots, perceiving the boats go away without them, became very outrageous, and attempted to leap overboard, but finding themselves too well guarded, they desisted, and began to say (in direct contradiction to what they formerly asserted, and on the strength of which we had allowed ourselves to be brought to the present anchorage) that there was not water enough for the ships to get through the channel of the S.W., as the wind rendered it impossible to return the way we came in, and the above passage the only one by which we could keep clear of the shoals which surrounded us. We determined to detain the pilots till the ships were out of danger.

Next day, the 10th, the boat returned with Mallum Ali, though the promise given to the Sooltan was compulsory, and did not, strictly speaking, deserve the least regard; yet out of respect to the word and honour of an Englishman, as well as for the sake of any of our countrymen who might hereafter fall into their hands, and on whom they might be tempted to retaliate their disappointment, it was resolved to adhere

* The people of Patta (besides their civil dissensions) were at this time at war with Lamo, an island a few miles to the southward, whose boats were continually on the look-out to attack those of Patta. The Sooltan made this also a motive for detaining us, under the pretence of preparing an armed boat to conduct us back to the ship; but we saw through his civility, and evaded it by telling him we had arms, and could defend ourselves. Patta has no trade at present; it used formerly to be resorted to for cowries (a small shell current as money in Bengal,) but of late years this trade has been discontinued.

to our extorted engagements as far as consistent with the safety of the ships. Therefore, 5 muskets, 2 pistols, 2 barrels of gunpowder, 2 bundles of musket-ball cartridges, and 160 flints, being all we could spare, were delivered, with which they departed very well satisfied, and thus terminated this troublesome business.

From the 10th to the 12th we were occupied in getting through the south-west channel, which proved a very tedious job. The pilots were either too ignorant or too unwilling to be of much service. and it became necessary to keep our boats out sounding in order to discover the passage and direct the ships how to steer: we found it very narrow, and interrupted in two places by bars, on which at high water, we found not more than one quarter less three fathoms. From the anchorage the channel ran W.S.W. ½ W. about half a mile and then turned to the southward. In leading out on the 11th, the *Sylph* grounded, but soon got off again; on the evening of the 12th, having got clear of the sands and rocks, dismissed the pilots, and stood out to sea during the night. Since anchoring at Patta, the weather (with the exception of the morning of the 8th, when a few drops of rain fell) was fair, with pleasant easterly winds and heavy dews at night. The thermometer generally at 82 deg. The town, as near as we could ascertain, (for we had no opportunity of determining it exactly,) is in lat. 2 deg. 8 min. S., and long., by chronometer, 41 deg. 13 min. E.; variation 14 deg. W.

13*th*, *Wednesday*.—No land in sight during the day, and light easterly winds and calms prevailed, with clear weather. Lat. at noon, 2 deg. 48 min. S.

14*th*, *Thursday*.—The course N.E. by E. Saw land bearing W.N.W., on which several large fires were burning, and at sunset were abreast of some small rocky islands, which seemed a continuation of the chain to the northward of Patta. Wind variable. Lat. 2 deg. 48 min. S.

15*th*, *Friday*.—In lat. 2 deg. 41 min. S.; variation per azimuth, 13 deg. 29 min. W. Fine weather, with light variable winds.

16*th*, *Saturday*.—In course of the forenoon yesterday, we passed a reef of rocks, part of which rose considerably above the surface of the water, and had a very remarkable appearance. The reef runs from the north-east point of Formosa Bay,* stretching several miles offshore in a south-easterly direction; the situation I supposed to be in S. lat. 2 deg. 45 min., for having to-day at noon observed in 2 deg. 58 min., it was then 15 or 16 miles astern of us. At noon the south-west point of the Formosa bay, bearing S.W. by W., observed two boats under the land: stood in with a view to speak them, and fired two guns, which they took no notice of, but crowding all sail, made round the point into the bay. Crossing the mouth of Formosa bay, at

* Within this bay, on the S.W. side, stood the ancient city of Melinda, the site of which, in crossing the mouth of the bay, we were at too great a distance from to see.

5 P.M., saw another reef with breakers on it. We were at this time about four miles from shore, in 24 fathoms sand, and the breakers could not, I think, be more than one and a half, or, at farthest, two miles from the ship. At five 5 h. 20 min. hove-to in 13 fathoms, when the water suddenly shoaled to six, five, and one-quarter less four fathoms, rocks. On shoaling, a mosque or round tower was observed on a point or projecting part of the shore, bearing W. $\frac{3}{4}$ N., distant eight or nine miles. Hauled our wind and stood out for the night, intending to return next morning to determine, as accurately as possible, the exact situation of this dangerous shoal. To-day there were light variable winds, with fine clear weather; the thermometer at 80 deg. Lat. at noon, 2 deg. 58 min. S.; long. 40 deg. 8 min. E.

17*th*, *Sunday*.—At noon observed in lat. 3 deg. 8 min. S.; the mosque seen on shore within the breakers yesterday bearing due west.* Spoke a country boat, which informed us the tower or mosque was called Gumanne; also that a river opened at a short distance a-head, called Quiliffa. At 4 P.M. were abreast of what we imagined to be this river, which has a small island at its mouth. Though the distance from the shore did not exceed two miles, no ground could be found with a line of 70 fathoms, and the water did not appear to be any way discoloured. Thermometer 79 deg.; lat. 3 deg. 18 min. S.; long. per chron. 40 deg. 28 min. E.; by lunar, 40 deg. 30 min. E.

18*th*, *Monday*.—The coast rose into gently elevated hills, which were clothed with wood, and presented a fine fertile appearance. At noon the opening of the Quiliffa† bearing N. $\frac{1}{4}$ E. 8 or 9 miles; the lat. observed was 3 deg. 32 min. S. About 2 P.M. saw another river said to be called the Channay, distant from the ship $1\frac{1}{2}$ miles right abreast. No soundings with 38 fathoms here. It had a large shoal with breakers close to the mouth, and its probable position may be in lat. 3 deg. 32 min. S., and long. 39 deg. 51 min. E.; variation by azimuth 13 deg. 26 min. W. To-day we had light easterly winds, with clear warm weather, the thermometer at $80\frac{1}{2}$ deg. Here a pretty strong southerly current was experienced. Long. 39 deg. 45 min.

19*th*, *Tuesday*.—The town of Mombas, or, as the natives pronounce it, Mampass, was abreast of us, distant two miles. The fort stands at a short distance from the shore, on a steep woody ridge, said to be an island, and has three flagstaffs on it. A little to the north-east three

* These must, therefore, have been the rocks (mentioned by Captain Bisset in his Memoir) on which the *Leopard*, Admiral Blankett's flag-ship, struck—(15th Feb. 1799, on a voyage to the Red Sea)—when bearing up to Zanzibar, after a fruitless attempt to beat up this coast during the N.E. monsoon. The mosque, however, or pagoda, as he calls it, is by no means a good sea-mark, as no ship ought to go so close as to make it sufficiently conspicuous. A much better are two hills to the N.W.; they are considerably higher than any near them, and in consequence easily known. The two hills are close together, and only partially divided by a shallow notch, resembling a woman's breast in form.

† The river Quiliffa is in S. lat. 3 deg. 26 min., and in long. (by means of several good observations) 39 deg. 26 min. E.

remarkable hills or hummocks serve as good marks for finding the place. Its situation may be in S. lat. 4 deg. 2 min., and in long. 39 deg. 41 min. 30 sec. E. At noon spoke a boat with a cargo of staves, two days from Zanzibar, and towards evening saw the island of Pemba ahead; worked to windward during the night to weather it. Pleasant easterly breezes, with fine clear weather. The thermometer at 80 deg. Lat. at noon, 4 deg. 7 min. S., long. by chron. 39 deg. 51 min. E.

20*th, Wednesday.*—No land in sight during the early part of the day, which was sultry and calm, but in course of the afternoon, a breeze springing up about sunset, saw the island of Pemba bearing S. ¼ W. 4 or 5 leagues. In the evening stood out to the eastward, intending to return next day and observe the position of this island. The thermometer at 81 deg. Lat. observed at noon, 4 deg. 34 min. S.

21*st, Thursday.*—At noon observed in 5 deg. 7 min. S. the east point of Pemba, bearing west about two miles. Pemba is a low even island of considerable extent, being perhaps 16 or 17 leagues in length. It is entirely covered with wood, and appears well peopled. The shore generally low and steep to the water's edge; shelves in some small spots to a sandy beach remarkably white, that at a distance shows like walls or pieces of buildings. Throughout its whole extent are numerous creeks or inlets, and towards the S.W. end is a deep bay with several small islands at its mouth, hitherto, so far as I know, undescribed. Fresh north-easterly winds, and cloudy weather; the thermometer at 82½ deg. Stood to windward during the night.

22*d, Friday.*—At noon saw the island of Zanzibar a-head; about sunset anchored in 25 fathoms, green mud, abreast of Timbat, the largest of the small woody islands at the north-west end of Zanzibar. A little after the *Sylph* came-to, close to us. The centre of Timbat bore S.S.W. The weather was warm and cloudy. The thermometer at 82 deg.; lat. observed at noon, 5 deg. 37 min. S.

23*d, Saturday,* 7 A.M.—Weighed and stood along the western side of the island, (the *Sylph* leading,) in from 5 to 15 fathoms, and at 11 anchored in the harbour in 7 fathoms, mud. The town of Zanzibar bearing S.W. by S., distant three-quarters of a mile. Each vessel saluted the fort with three guns, which was not returned. In course of the afternoon sent the boat ashore with the interpreter to acquaint the Hakim of our arrival. Moderate northerly winds and fair weather.

24*th, Sunday.*—Accompanied the commanders on a visit to the governor, or Hakim, as he is titled. He received us with great civility, and made many professions of friendship and assistance, which, however, we did not, in the sequel, find him disposed to act up to. We were saluted on landing and coming off, by the fort and a ketch in the harbour. Thermometer 82½. Fair weather.*

* The expedition sailed from Bombay on the 2d January 1811.

PROCEEDINGS AT ZANZIBAR FROM THE 25TH FEBRUARY TO THE 9TH APRIL 1811, WITH SOME ACCOUNT OF THE ISLAND.

Zanzibar, situated between the 6th and 7th degrees of south lat., and 39th and 40th of east long., is an island of considerable extent, being nearly 50 miles in length and 20 in breadth; its distance from the east coast of the African continent, along which it stretches in a north-easterly and south-westerly direction, may be about 15 or 16 leagues; between the continent and it, however, there is no passage for large vessels, except through the harbour, as a reef runs obliquely across from the African shore to the small islands which lie close to the western side of Zanzibar. These islets, which stand considerably nearer to the south than the north* extreme of the island, are all, except one, covered with wood, and help to form the harbour. They run in a semicircle, the concave side of which is towards Zanzibar, and are connected together by reefs of rocks, which, in blowy weather, break the swell, and render the port remarkably smooth and safe. The entrances into it are from the north and south; both lead between the small isles at the extremity of the semicircle and the western shore of Zanzibar. The northern entrance, which leads within a small woody isle called Frenchman's Island, is very narrow and crooked, in consequence of sand-banks, which run out from opposite shores, crossing each other. On the shallowest part (which will be known by bringing the three northern woody isles in one) the depth is not more than from three or four fathoms. The southern passes between a sandy isle,† and the point on which the town of Zanzibar stands is broader than the other, and has seven or eight fathoms water in it. The depth within the harbour is from seven to nine fathoms, with a tolerable good bottom: the rise of water during spring is near three fathoms. Immediately adjoining the north end of the town is an extensive creek or inlet which runs a little way in, and turns up behind the town. Here vessels of all descriptions are hauled up in security during the virulence of the south-west monsoon. With a very little care it might be converted into an excellent dock, and deepened so as to admit with ease ships of at least 500 or 600 tons. The appearance of the island is extremely delightful. It is in general low, especially at the extremities, where it is thickly covered with a jungle and brushwood; but towards the middle, the land rises into hills and gentle eminences, which are cultivated and clothed with cocoa-nut trees. Besides the periodical rains, which fall here from the month of March till September, the island itself is well watered with a variety of springs, which unite and form a number of delightful streams that flow during the dry season, and keep up that appearance of fertility and beauty which it exhibits throughout the whole year. None of these streams are large; that at which the ships water is situ-

* There is also a group at the east end of the island.

† The only one of this group of islands that has no wood on it.

ated about one and a half mile north of the town, where it flows into the sea at the north entrance of the harbour. The water when first taken up is good, but from the quantity of putrid vegetable matter in suspension, upon keeping a short time it becomes very offensive both in taste and smell; in a few weeks, however, it regains its original sweetness. Ships ought always to fill at low water, else they will have it brackish. The climate of Zanzibar is similar to that of India, only the monsoon, or rainy season, sets in sooner. From September to March the season is dry and warm; the rest of the months are rainy and tempestuous. During our stay the thermometer ranged from 80½ to 87½ degrees at noon; and from the date of our arrival to the 5th of March, the weather was dry, cloudy, and warm, with northerly winds. From that till our departure it was in general cloudy, with frequent violent squalls of wind and rain from the south-west, attended with much thunder and lightning. The town of Zanzibar is situated on the west side of the island on a tongue of land formed by the above-mentioned creek, and faces the small sandy isle which constitutes the southern boundary of the harbour. It is large and populous, and is composed chiefly of cajan huts, all neatly constructed with sloping roofs. There are, however, a good number of stone buildings in it belonging to the Arabs and merchants; and in the centre, close to the beach, stands a fort, seemingly partly of Arab, partly of Portuguese, construction. It is square, with a tower at each corner, and a battery or outwork towards the sea, in which I observed four or five guns of French manufacture, remarkable for their length. In the middle of the town we observed a tree of uncommon size: its height was about 8 or 10 feet, and from a rude measurement which we took, its circumference could not, I think, be less than 36 or 40.* Zanzibar, according to our observations, stands in lat. 6 deg. 6 min. S., and long. 39 deg. 15 min. E.† It is the only assemblage of habitations on the island that deserves the name of town, or even village; for the principal part of the inhabitants without the town being slaves of landholders, are scattered over their respective owners' estates. The sovereignty of the island belongs to the Imaum of Muscat, who appoints the Hakim or governor, and to whom the revenue derived from its commerce and land-tenures devolves. This revenue is said to amount to 60,000 crowns annually, though I have reason to believe it to be much more. His whole establishment consists of the Hakim, an assistant or councillor, and three Arab officers to command the garrison. The present Hakim is a slave of his own, whose history is somewhat curious: he is named Yacoud, and was originally from Abyssinia: he belonged to the Imaum's uncle and predecessor, who, detecting him in some familiarities with one of his young female slaves, caused him to be emasculated. Since his former master's death he has become a great favourite of the present one, who promoted him to

* This tree is, by the natives of Hindostan, called Brosh, and bears a large oval fruit with a smooth skin; but neither it nor the wood of the tree is of any use.

† Variation 8 deg. W.

this distant and lucrative government,—perhaps considering that, as he had lost all relish for the only pleasure that can induce an Arab to dissipate his own or his master's money, he would likely turn out a faithful and valuable servant; nor has he been disappointed. Yacoud's ruling passion is the love of power, to attain which he himself lives like a beggar, and tyrannically extorts from the inhabitants large sums, which, with his own savings, he faithfully transmits as the price of his continuance in the government. The people, however, who live under his sway, detest and despise him. The revenue, as already stated, arises from land-tenures and customs; and though there is no regular land-tax levied, yet it is sometimes resorted to to raise a supply, an instance of which happened while we were there. One of the Imaum's ships arrived from Muscat with a demand for 25,000 crowns, to assist him in opposing the Wahabees, though I sincerely believe it was to defray the repairs of the very ship which brought the demand, and which was going to Bengal for that purpose. As this sum was not in the Hakim's possession, he immediately imposed a kind of land-tax, so much to be raised in each district, the chief man of which was ordered to collect it, and be answerable for its payment at a stated time, in default of which he was to be imprisoned. The other source from whence the revenue proceeds is a custom of 5 per cent. allowed by the Imaum to be gathered on all imports. This, however, is often very unjustly collected, and few, I believe, except Arabs, ever pay so little on their goods as the lawful sum. The Imaum maintains no kind of military force. The Hakim's slaves, amounting to 400 or 500 men, are armed, and serve as soldiers under the above three Arab officers. There are no imports or exports, though we were told the French pay voluntarily a premium of 10 dollars each for the slaves they take, to secure the good will of the governor; they are, in consequence, great favourites, and from this circumstance we may easily account for his subsequent coolness to us, which was not lessened by his hearing of the surrender of the Isle of France while we were there, and on which occasion both vessels fired a royal salute. The principal articles of export are slaves and ivory, also a small quantity of drugs.* The number of slaves annually sent to Muscat, India, and the Isle of France, &c., are estimated at not less than from 6000 to 10,000. The quantity of ivory is also very great, and is sent principally to Surat. Of imports, the following are the chief: Surat and Dungaree cloth from Cutch; iron, sugar, and rice from Bombay, rice from Pemba, dates from the Gulf of Persia; slaves, ivory, and drugs, from Magadosho, Brava, Ganu, Mombas, and other towns along the African coast.† The number of trading vessels, including those from Semap and Cutch, amounted,

* Cocoa nuts (of which the island produces vast quantities) are also exported to Malabar, and also wax and tortoise shell.

† Dried salted shark and other fish, and ghee, are brought in considerable quantities from Socotra, likewise chinaware, earthen jars, and toys and ornaments from Surat.

at the time we left the island, to upwards of 50. I could not procure accurate information as to the quantity of the above articles annually imported; but from the amount of the custom, the value cannot be under £300,000. We were told that the demand for European goods on the continent was very great; and if the natives had any returns to make besides ivory and slaves, I have little doubt but we might here find an extensive and lucrative vent for numerous articles of our manufacture.

A GENERAL VIEW OF THE EXPORTS AND IMPORTS OF ZANZIBAR.

Exports.	*Imports.*	
Slaves,	Surat Cloth,	From Cutch.
Ivory,	Dungaree Cloth,	From Cutch.
Drugs,	Iron, Sugar, and Rice, from Bombay.	
Coir,	Salt Fish and Ghee from Socotra.	
Cocoa-nuts,	Cloths, Cotton,	From Surat.
Bees' Wax,	China Ware,	From Surat.
Tortoise Shell,	Earthen Jars,	From Surat.
	Toys and Ornaments,	From Surat.
	Rice from Pemba.	
	Dates from Gulf of Persia.	
	Slaves, Ivory, Drugs,	From the African Coast.
	Bees' Wax, and	From the African Coast.
	Tortoise Shell,	From the African Coast.

The inhabitants of Zanzibar consist of Arabs, descendants of Arabs from Souallie mothers, and Souallies. The Arabs are not very numerous; but the principal part of the slaves and landed property belong to them. A considerable number of Banians likewise reside in the town, many of whom appear to be wealthy, and hold the best part of the trade in their hands. The Souallies form by far the major part of the population, and are almost all slaves to the Arabs—800 or 900 of them sometimes belonging to one individual. They are in general purchased in their native country, on the opposite shores, when young, and are brought here by the slave merchants, who dispose of them either to the Arabs or to the merchants, &c., for exportation. Those are fortunate who fall into the hands of Arabs, who are justly famed for the mild treatment of their slaves. They are allowed a small habitation on their master's estate; and not being over-worked, and the fertile soil furnishing with little trouble sufficient means for their subsistence, they seem to enjoy a considerable portion of contentment and happiness—a strong proof of which is, that they propagate freely. All, however, are not equally well situated; and the advocates for the slave trade ought to witness the market of Zanzibar, after which, if they possess the slightest spark of generous feeling, I will answer for an alteration in their present opinions. The show commences about 4 o'clock in the afternoon. The slaves, set off to the best advantage, by having their skins cleaned and burnished with cocoa-nut oil, their faces painted with red and white stripes, which is here esteemed elegance, and the

hands, noses, ears, and feet ornamented with a profusion of bracelets of gold and silver and jewels, are ranged in a line, commencing with the youngest and increasing to the rear according to their size and age. At the head of this file, which is composed of all sexes and ages, from 6 to 60, walks the person who owns them; behind, and at each side, two or three of his domestic slaves, armed with swords and spears, serve as a guard. Thus ordered, the procession begins, and passes through the market-place and principal streets: the owner holding forth, in a kind of song, the good qualities of his slaves, and the high prices that have been offered for them. When any of them strikes a spectator's fancy the line immediately stops, and a process of examination ensues, which, for minuteness, is unequalled in any cattle market in Europe. The intending purchaser having ascertained there is no defect in the faculties of speech, hearing, &c., that there is no disease present, and that the slave does not snore in sleeping, which is counted a very great fault, next proceeds to examine the person; the mouth and teeth are first inspected, and afterwards every part of the body in succession, not even excepting the breasts, &c., of the girls, many of whom I have seen handled in the most indecent manner in the public market by their purchasers: indeed, there is every reason to believe that the slave dealers almost universally force the young females to submit to their lust previous to their being disposed of. The slave is then made to run or walk a little way, to show there is no defect about the feet; and after which, if the price be agreed to, they are stripped of their finery and delivered over to their future master. I have frequently counted between 20 and 30 of these files in the market at one time, some of which contained about 30. Women with children newly born hanging at their breasts, and others so old they can scarcely walk, are sometimes seen dragged about in this manner. I observed they had in general a very dejected look; some groups appear so ill fed that their bones appeared as if ready to penetrate the skin. From such scenes one turns away with pity and indignation, and while he execrates the conductors of this infamous traffic, blushes that his country should ever have sanctioned such iniquity, and remembers with exultation the men who freed her from so great a disgrace. The number of inhabitants on the island may be estimated at 200,000,* three-fourths of whom at least are slaves. The Souallie tribe appears to have sprung from a mixture of Galla negroes, Arabs, natives of India, &c. They inhabit that portion of the African coast extending from the Equator to the Mozambique, as the Soomallie tribes do that on the north, stretching to Cape Guardafui; their country is, however, confined to a narrow tract along the sea-coast, the district behind belonging to the Galla,† who are also divided into two different kinds—those living north of the line behind the Soomallies are denominated Borran Galla; those on the south side, behind the Souallies, are distinguished by the term

* I do not give this as information to be depended upon.

† The Galla are in their persons exactly similar to the west-coast negroes.

Carratche. Whether these differ much in person or manners I have been unable to learn. The Souallies have much more of the negro appearance than the Soomallies; they have both woolly hair, and their skins are of a deep black, but the Soomallie has neither the flat nose or thick lips which distinguishes the negro, and which is a very prominent feature among the Souallies of Zanzibar. The Soomallies are also to be distinguished by their slender make, which renders them more active, and they possess a superior degree of vivacity to the others, who appear to be of a grave character. With regard to the religion and peculiar customs of these people, we had little opportunity of becoming acquainted with them. The Souallies at Zanzibar being under the sway of Arabs, in general adopt their manners; and as to religion, those who profess any, I believe, follow them in that likewise. We did not observe that any of their domestic customs were singular enough to deserve a particular description, except one, which, though not peculiar to them, is perhaps carried to a greater length than in most other places. I allude to the manner in which they inter, or rather expose, their dead. It is a habit all over the town to bury amongst the houses, commonly under a tree, close to the deceased person's former habitation, which presents to a stranger the appearance of a churchyard; and it would be well if the eye alone was the only organ offended. But though the Arabs and wealthy are properly covered, and have neat tombs erected over them, the poor are only wrapped up in a mat, and have scarce sufficient sand thrown over the corpse to hide it from the view; indeed, some part of it is generally to be seen sticking through; and as to the slaves, they are often laid out to putrify on the beach, not a single rag of cloth or handful of earth being laid over them. In consequence of this disgusting practice, the stench in and about the town is intolerable; and co-operating with the noxious effluvia which arises from the putrid vegetable matter during the rainy season, tends to produce fever and fluxes, which, we learned, make annually during that period dreadful ravages among the inhabitants. The English have hitherto had very little communication with Zanzibar, though the French are frequently in the habit of coming there from the Mauritius for slaves and Mocha coffee. Previous to our arrival, only one English vessel had touched at the island since Admiral Blankett's squadron was there in 1799, on his passage up the coast to the Red Sea. Captain Bisset, whose account of that expedition is published by Dalrymple, says they were told no British ship had been there previous to that, within the memory of the oldest person then living, and that they found the natives of the inferior order so ignorant of the value of coin, as to prefer, in their exchanges, a gilt button to a guinea. This might have been the case then, I will not dispute; but we not only found them well acquainted with money, but as dexterous at overreaching in a bargain and exorbitant in their demands as any dealer in the bazaar of Bombay. They were, however, as he justly observes, very civil and hospitable, though not so much as he

describes; but this difference was probably owing to the dislike which the Hakim showed to us. Our taking no hand in the slave-trade was remarked to have considerable influence among the generality of the lower people in giving them a favourable impression of our character, and for a contrary reason they never failed to execrate the French, notwithstanding they were favourites of their Hakims. The soil of the island is in general light and sandy towards the coast, but a little inland it is found to be a rich black mould, seemingly composed of decayed vegetation, and the numerous springs and periodical rains, with the excellent shelter afforded by the cocoa-nut trees, which everywhere cover the island, all conspire to render it extremely fruitful. Nothing can exceed the profusion of fruits abounding in every quarter, all of them excellent. Pine-apples of the most delicious sort are growing everywhere wild, and heaps of oranges, guavas, &c., for want of consumers, are left to rot on the ground which produced them. The following are the principal fruits and vegetable productions of the island, viz.: pine-apples, guavas, mangoes, lemons, limes, oranges, plantains, bananas, pomegranates, (a few imported by the Arabs,) cocoa-nuts, and many others, sugar-canes,* pumpkins, onions, sweet potatoes, and the root of a plant which is called by the natives mahogo, (the *farina de pas* of the Portuguese.) Why the natives do not cultivate grain is hard to conceive; perhaps the great plenty of the cocoa-nuts and the mahogo, with the profusion of fruit, supersedes the necessity, and renders them averse to the labour of raising corn, although their country must be exceedingly well adapted to it. The mahogo, which is the principal article of diet, is eaten by them either simply roasted or boiled, or it is cut into small pieces, which, being dried in the sun, is ground into flour, of which is made a very palatable kind of bread. The operations of agriculture are not numerous, and indeed consist chiefly in clearing the ground; this is done by fire, and seems to be the practice throughout Africa. Within the tropics, where the luxuriancy of vegetation is so great, it would be a work of great labour, if not an absolute impossibility, to get rid of this in any other way. The time of doing it is at the end of the dry season, when the crops are collected and the rains are about to set in. In coming down the coast, we observed fires all along the fertile country south of the line. Asses and camels are the only beasts of burthen,† and being scarce, are very valuable; horses have been imported by the Arabs, but will not live. Bullocks and goats‡ are good and in plenty, and can be procured for a moderate price; a good bullock fetches from 10 to 12 dollars in the town, but might probably be got for much less in the country. The rest of their quadrupeds are cats, and monkeys of various species. There are

* The sugar-cane grows in great plenty; but the inhabitants are ignorant of the art of making sugar.

† Monkeys are also found on the island, with foxes and wild hogs, &c., &c.

‡ Rice and ghee can be procured in considerable quantities, but it will be found expensive for strangers to provide any great supply of those articles.

scarcely any dogs on the island, the Souallies having a great aversion to them. When a dog accidentally touches one of these people, he shows signs of loathing and abhorrence. Poultry is plentiful and cheap; 16 large or 18 small fowls may be bought for a dollar; but what is a little extraordinary, eggs are both scarce and dear, and when procured are generally bad: they have also Muscovy ducks and Guinea fowl, which last are found wild on the island. The variety of birds and wild-fowls is not great: the principal are the whistling duck and curlews, and the ibis of the ancients, so numerous on the banks of the Nile, pigeons, doves, and a few others. Spanish dollars and German crowns are the coins commonly current among them, and though they will take some others, they prefer these. Among the shoals and rocks which connect the small islands that surround the harbour, and in the harbour itself, delicious fish of great variety are easily taken in plenty, either with nets or the line and hook; and those who will take the trouble to examine the shoals at low water during spring tides, will find their labour amply repaid by a collection of curious and rare shells, which for beauty are not to be surpassed by any in the known world.

Notwithstanding the heat of the climate, the vast quantity of wood, and filthy manners of the inhabitants, it does not appear that Zanzibar is an unhealthy island, except during the rainy season, when fevers and fluxes are, from the above causes, very prevalent, but which by proper regulations might be easily obviated. In a place where there is no medical assistance, or receptacles for the diseased, it may be supposed numerous miserable objects would be met with; this, however, is not the case. In walking about the town, I did not remark a larger proportion of these unfortunate beings than is generally to be met with in most of our own settlements in India. Exclusive of fevers, dysentery, and their consequences, such as dropsy, obstructions, &c., no other disease appeared to be frequent, except venereal, under which, in all its stages and forms, a very great number of persons laboured. Their fevers are often of the remittent form, but more frequently of the intermittent kind; and, in addition to the consequences already noticed to follow them, sometimes terminate in an unusual weakness and pains over the body, particularly of the lower extremities, which cause sometimes a total loss of power. I am unable with certainty to determine the cause of this; perhaps it may arise from their sleeping on wet or damp ground while confined with these disorders. The small-pox—that scourge of the human race—also often visits the natives of Zanzibar. We were told that about two years ago it made dreadful ravages all over the island: 15,000* are said to have perished in the town alone. This intelligence led me to hope they would receive with avidity any proposal to secure them from the effects of so dreadful a visitation. Though the vaccine matter brought from Bombay was

* This, I think, must be an error; 5000 is more probable,—the person who gave me the information being rather given to exaggeration.

now nearly eleven weeks old, and I consequently had great doubts of its power, it was resolved to let slip no opportunity of trying to introduce it among them. I therefore proposed it to the Hakim at our first interview, confident that it would be eagerly solicited by those who had children and young slaves belonging to them. In this, however, I was much disappointed; for though their interest and the safety of their offspring were at stake, I had the mortification to find their prejudices stronger than the sense of either, and it was with the utmost difficulty I could procure leave to try it on two children. They were inoculated twice over, without being able to produce the disease; but I had no great reason to regret my failure, for I afterwards heard that the French, who, on purchasing young slaves, always vaccinate them, had often introduced it among the inhabitants, but that it had been found impossible to propagate it. Is not this astonishing, that a people with whom self-interest is a stronger passion than any other, should be under the influence of motives which cause them to act in direct opposition to it? One person (he who allowed me to inoculate his children) acknowledged he himself had lost no less than thirty young slaves during the late prevalence of the disease. Perhaps the indifference they show at the proposal of a preventative remedy arises from a want of faith in its efficacy.

We now began to think of setting out on our return along the coast to Mocha; the wind had begun to set in steady from the S.W., and our consort, the *Sylph*, which it had been deemed advisable to convert into a brig, being ready to return to Bombay, whither we had orders to send her, we were about to depart, when a circumstance occurred which for some time delayed it. The Surat merchants, who had often complained of the Hakim's treatment, represented that he had demanded 3500 crowns from them as their proportion of the tribute exacted by the Imaum of Muscat, and in failure of payment had threatened them with imprisonment. As these people were trading under the English flag, and were in fact British subjects, Captain Smee did not conceive that a foreign prince had any right to tax them, especially as they had already paid the customary port dues. Impressed with these sentiments, he made a representation to the Hakim, who in consequence withdrew his claims, but privately threatened the merchants with a double imposition after our departure. To prevent this, it was determined to leave the *Sylph* to countenance them during their stay, and convoy them across to India at the breaking up of the rainy season. While the Hakim, who had been extremely inimical to us during our stay, and always anxious for us to be gone, informed us he was coming to return our visit; this he had on various pretences heretofore delayed; however, on Sunday, the 7th April, he came on board, when both ships dressed and saluted him, and he was, notwithstanding his ill behaviour, treated with the greatest attention.

On Tuesday, 9th, we weighed and sailed from Zanzibar, and in the evening came to anchor under the small island of Timbat, at the north

end of the island. On the morning of this day, Henry Golding, a stout, healthy seaman, was found dead between decks: he had no known complaint at the time, and his death was supposed to have been caused by suffocation, as it was understood he went to sleep very much intoxicated. Having interred him on Frenchman's Island, the watering boat returned on board, and reported they had found the body of a young female recently murdered, lying among the bushes at the fresh-water stream: as they had no means of interesting the neighbours in her fate, they buried her immediately. On Wednesday, the 10th, we got under weigh, and passing between Pemba and the mainland, where there is a fine broad channel, we, without anything further remarkable occurring, anchored in Mocha Roads on the 26th April 1811.

SPECIMENS OF DIFFERENT LANGUAGES USED ON THE EAST COAST OF AFRICA.

English.	Souallie.	Soomallie.	Galla.
God	Moo,ungar	Ei,boo	Wa,ag
The Sun	Joo,war	Ee,ve	Ha,thoo
The Moon	Mo,azi	El,bait	Tee
A Star	Niotar	Tigeen	
Wind	Pai,po	Ooni,far	Affoaw
Rain	Foo,ar	Roo	Buk, Rai,na
Lightning	Umai,mai	Bir	Gur,ka
Clouds	Ma,vingo	Dunool	Buccat
Earth	Mee,tie	Dool	Luff
A Hill	Tebalee	Te,bal	Dega,cha
Iron	Tchoomar	Bir	Le,vil,la
Gold	Da,a,boo	Dey,ib	Dee,ma
Silver	Fai,da	Cul,law	Cullan
A Stone	Tee,war	Luid	Dugga,cha
Fire	Mo,to	Dub	Ee,wee,da
A Tree	Me,ty	Gar,e	Meacoo
A Wood	Me,zee,too	Doow	Alla
A Valley	Waang,gooa	Iid	Rana
A Plain Level Ground	Met,ee Souah	Dool filah	Luftee, Medgur
A Tent	Chunda Rooah		
Fruit	Ma,toon,da	Cur,row	Len,ea,ua,Wanee
Grass	Mah,nee	Waa,kut	Boo,joo
A Flower	Nu,wah	Eis,gow	Ajawa
A Bee	Noo,kie	Shin,nee	Lhin,nee
Honey	Ussel Nookie	Mal,low	Dug,mee
Wheat	Nga,noo	Bool	Sheer
Indian Corn	Ma,hin,dee	Gellae	Mezingo
Barley	Nga,noo	Bool	Sheeve
Water	Ma,ajie	Bai,hai	Bus,saan
A River	Ma,to,ny	Wah,wee	Do,ab

English.	Souallie.	Soomallie.	Galla.
A Fountain	Reech,wa	Matha,eereed	
A Well	Kis,see,mah	Hail	Alema
A Fish	Sum,ma,kee	Ma,ta,lee	Woor,too,moo
A Horse	Fa,rassay	Far,assy	Furda
A Mule	Bagullah	Dee,mair	Ha,aree
A Camel	Ga,mee,a	Gale	Galolai
A Cow	Gnom,bai	Lo,yah	La,worn
A Calf	N,damar	Wai,Lo,yah	Julbeea
An Ox	Fa,hal,lie	Dee,mee	Dee,mee,cha
A Sheep	Cun,doro	Heeree	Ree,ai
A Lamb	Mototo, ya, Cundoro	An,nok, Hee,ree	Watteereai
A Goat	Boozei	Rarinyode	Horar
A Kid	Mtoto, ya Boozei	Annok Rarinyode	Wattee Horar
A Horn	Pembai	Gasse	Gaisse
The Skin or Hide	Go,vee	Mug,gar	Le,tee,lai
A Lion	Leem,bar	Loo,ar	Nain,gai
A Dog	Mbooar	Hai	Lur,rul,tai
A Locust	N,zee,gar	Luddi	Caboo, Yalais
A Bird	N,daigii	Shim,bir	Shim,bie,ree
A Man	Moo,too	Dudd	It,mee,num,ma
A Woman	Ma,noo,moo, Kie	Deea, Dow	Nud,dun
A Child	M,toto	Dull	Ha,go,lai
A Son	Kee,jah,nar	Duee	Ha,go,lai
A Brother	Doogoo	A,loo, Kai	A,b,boo,laissee
A Sister	Oom,boo,langar	Thoo,ra,shai	Abboolaistuteeah
Father	Ba,bah	How, Kai	Ab,ba, Ke,ea
Mother	Mah,mah	Ha,hiea	Haddatuah
A Friend	Kuf,fucke	Wee,thai	faa,lee, Keea
The Head	Keetwar	Ma,tha	Muttai
The Hair	Noo,el,lai	Docore	Kiuv,faisse
The Eye	Mau,choo	Ee,low	Ee,la,tua
The Nose	Poo,ah	Sun,ka	Foonara
Mouth	Moo,oh,moo	Janoor	Haffar
Teeth	Mai,noo	Eel,kow	Jekana
Plantains	Dee,zee	Mo,zee	
Pine Apples	An,na,nas		
Yams	Kee,az,ee		
Joarry	Moo,ta,ma	Misse,gar	
Rice	Mo,chai,kai	Beer,eed	
Paddy	M,poon,gar	Bee,bed	
A Boat	Batilla	Do,nie	Hoo, woo,loo
A Compass	Deyna	Deyza	

Numerals.

English.	Souallie.	Soomallie.	Galla.
One, 1	Mow,ya	Ko	Ta,ka
Two, 2	Bee,tee	Lum,ma	Lum,ma
Three, 3	Pa,too	See,dee	Sah,dee

English.	Souallie.	Soomallie.	Galla.
Four, 4	Hin,na	Huffar	Hafoora
Five, 5	Ta,noo	Shen	Shen,noo
Six, 6	See,ta	See	Jah
Seven, 7	Sub,ba	To,da,ah	Pudba
Eight, 8	Naa,ny	See,ed	Sud,deed
Nine, 9	Pain,dar	See,gail	See,ga,lee
Ten, 10	Koo,mee	To,moon	Koo,dun
One Hundred	Mee,ah,moyah	Ko,kool	Dee,bah
One Thousand	Elf,moyah	Koon	
One Lac	Lac Moyah		

PERSONALS.

English.	Souallie.	Soomallie.	Galla.
Me	Me,ya	Ha,nee	Han,nah
You	Wai,wai	Ha,thee	Hattee
To give	Nup,pai	Shain	Anna Ken,nee
To take	Su,ah	Ka,tho	Ho,to
To buy	Moo,noo,ah	Geth	Bee,tee
To sell	Koo,za	Ee,yeth	Anna Bee,tee
Tell him	Moom,bera	Bar,reen	Doo,bud
Salutation on meeting a friend	Jambo or Yambo	Fa,heitah	Hofo
Answer	Jambo,salmeen	Ma,hah,dul,lah	Nuggeen
Good morning	Sum,ka	Bur,rutha	
Answer	Nur,hub,bar	Bur,sum,ma	
Hear	See,kee,a	Muggul	Duggoifavoo
Call him	N'doe		
The Lips	M'domo	Far,roon	Haffar
Tongue	Oo,lee,mee	Ar,rah	Arrubnee
Voice	Mai,mai,no	Bar,rung	Doo,bee
Ear	Mas,si,kie	Dey,gar	Goo,roo
Chin	Ree,da,roo	Gir	Ar,reed,neetrie,a
Neck	Len,jo	So,kune	Moor,mak
Shoulder	Bai,jar	Gur,orap	Gur,rup
Hand	Ree,ganja	Gun,na	Hurke
Arm	Moo,co,no	Gurrup	Gurrup
Finger	Chandar	Fur,nee,o	Koowai
A Man's Breast	Kee,foo,ah	Hai,wair	Hammud
A Woman's Breast	Ma,zee,wah	Na,as	Moo,che
The Belly	Toom,bo	Al,lo,sha	Gurra
The Bowels	Ma,toom,bo	Mad,een	Chad,do,tah
Heart	Moh,yoh	Wus,sna	Lup,pai
Blood	Da,a,moo	Deek	Deek
Skin	Go,vi	Muggar	Muggar
Leg	M'goo	Loo,gar	Seerbah
Foot	Oo,wy,oo	Sa,an,ta	Tanah
Heel	Ris,syeenoo		
Toes	Chan,da	Fur,nee,o	Koo,wai

TIME.

English.	Soualiie.	Soomaliie.	Galla.
Year	Marka	San,no,to	Geur,na
Month	Mey,zee	Sha,ai,ko	Batee,to,ka
Week	See,koo,sa,ba	Todo Wageen	Gooya,tud,ba
Day	See,koo,moya	Gai,ko	Goosjoo,matoke
Winter (Cold)	Barrioir		
Summer (Warm)	Ha,a,ree		
Mid-day	M,chanah	Doo,hoor	Saofata
Mid-night	Oo,see,ko	Ahimen	Uikur
Morning	Assooboyee	Laar	Bur,ree,tee
To kill	Coo,pei,gah	Doe	Dokee
To lose	Po,tai,ra	Doo,meu	Ba,thee
To steal	Wee,fee	Hee,dow,lai	Hat,too
To cut	Teen,dar	Ko,ud	Go,iah
To fight	Pee,gan,ah	Ees,doe	Haiioo,danah
To burn	Fangonmota	Dai,boo,ree	Geweedamadalvi
To fear	Oh,gah	Lecafsetia	Lo Dahtae
To love	Pendah	Tail	Leejalattee
To drink	Koonwar	Wur,raap	Doo,gee
To eat	Koo,li,ah	Oon	Niahdoo
To get drunk	Koo,lai,wah	Mud,dah	Did,dik,see
To run	Cuenda M'be,a	Roar	Daih,see
To leap	Coo,ro,kar	Boaith	Ootaal
To fly	Coorokar	Boaith	Ootaal
To swim	Ko,gai,lai,ya	Dow,wai	Tlee,akuddu
To walk	Ter,ra,tu,bo	Huss,eel	Kaisse
To wash	Koo,na,wee	Da,ah	In,da,ga,da
To die	Kufa	Oornathee	Doo,re
To bury	Kozeeka	Dook	Nukkae
To hide	Koofeega	Ra,hee	Olokahee
To dance	Gomar	Goor,bain	Sur,boh
To sing	Koo Taysar	Dale	Ecntoorna
To be glad	Foor,a,har	Ha,fa,rar	Gun,a,mee,da,jee
To be sorry	Koo,cho,kar	Dee,reef	Dad,da,wee
To weep	Koo,be,a	O,ee,teen	E,m,bew,a
To curse	Cu,em,ba,moon,joo	E,teen	Har,ruf,u
To bless		Hai,baa,dow	Wa,ag,na,ai,bees
To marry	Ar,ro,se	A,roos	Im,foo,nah
To be with child	Meem,ba	Oor,ka,wah	Ool,fa,kub,dee
To be delivered	Koo,zar	Dah,lee	Dai,tie
To forget	Koo,za,ha,ho	Heelmaun	Wui,la,lai
To remember	Koom,boo,ka	To,wee	Hil,lal,cha,mai
To be sick	How,ai,zee	Ma,fai,yo	Doo,koo,wai
To hear	Selkia	Mug,gul	Dai,gai,fa,doo
To smell	Koo,noo,za	Hoor,see	Een,foo,nan
To taste	Koo,on,dan	Da,da,mee	Da,deem,sa
To converse	Moo,zoh	Wai,dee	Gah,fud,da
To stand	Cum,do,ca	Jokso	Ka,hee
To come	N'joe	Kow,ai	Ko,te
To go	Coo,nin,da	Tahoo	Beneethaimi
To circumcise	Coo,ta Ee,ree	Gooth,main	See,lah,ma
To believe	Sad,dee,ka	Koon	Doo,gar
To lie	Go,on,gow	Bane	Dahrah

English.	Souallie.	Soomallie.	Galla.
To swear	Toe,ca,nah	Ha,ec,teen	Hur,ruf,sel
Near	Car,ri,boo	So,do,wow	Ta,hee
Far	Baotie	Daio	Ar,lah
Up	Loo	Kor	De,eoh
Down	Chee,nee	Hens	Fa,goh
Open	Foon,goo,ah	Feor	Bah,nee
Shut	Foon,gan	Heer	Ee,dee
Before	M'bai,lee	Hoor	Im,fa,ga,tee
Behind	Yoo,mar	Praith	Run,dar
Small	M'do,go	Gah,war	Ga,wa,wa
Great	M'coo,ba	Heen	Goo,dah
Rich	Fai,da,tai,lai	Ma,al,bur,then	Door,rai,sah
Poor	Th'saif	Mas,keen	Dai,jah
Dark	Kee,zar	Moo,g,dee	Dookun
Light	M'eha,na	Ma,been	Goo,jah
Deep	Chie,nee	Lai,sai,jee,ra	Fa,ja
Long	Ba,lee	Dair	Fa,jo
Bitter	Kee,ka,lie	Har,rav	Had,dai,dah.
Sweet	Taam	Mace	Mee,ah,wah
Much	Tailai	Bur,than	Goo,dah
Little	Ca,do,go	Gah,wan	Dee,ko
Beautiful	Moo,too,mai,ma	Dad,fi,lai	Mee,dah,gah
Ugly	See,moo,ai,ma	Mas,soo,ban	Hah,mah
Strong	Goo,foo	Lai,ho,at	Ge,rai,ja,wah
Weak	How,ai,zee	Ma,fa,yo	In,doo,coo,wah
Deaf	Hiz,zee,wee	Daig,ma,lac	Goo,roo,in,ka,hou
Wild	Wa,zee,moo	Jee,nee,ko,nah	Ja,joo,ko,wah
Tame	Moo,ni,oon,gai	Nun,sy,eef	O,ko,lah
Dry	N'Ka,foo	Unguh	Een,kub,doo
Moist	Pa,na Ma,ajee	Bai,daar	Ee,gee,tie
Hot	Moto	Keol,oot	How,die,too
Cold	Bar,ri,dee	Kar,wah,ab	Gub,ba,no,tie
Red	Ra,an,jee	Goo,dood	Deem,too
Green	Mo,wee,tee	Hoor,oot	
Blue	Gne,woo,zee	Moo,thow	Gur,ra,chee
White	Wai,hoo,pai	Hais	Ha,thee
Black	Wai,hoo,see	Moathow	Gar,ra,che
The Loins	Ree,oo,ne	Moho	O,kul,la
The Back	Ma,o,on,go	Donie	Do,nie
A Ring	Pai,tai	Far,ratie	Goo,wai, Kay,a,doo
A Book	Choo,ah	Koo,toob	Kee,tab,nee
A Spy-Glass	Moo,an,zee		
Pistols	Pas,to,lar	} Nussie	
Musket	Bun,doo,kill		Kokai
Great Gun	Moo,zen,gar	Haley	Kokai
A Ship	Jee,ah,zee	Har,reen	O,woh,lah
A Watch	Sa,ar		
Shells	Room,bai		
A Mirror	Kee,ho	Bildai	O,ah,wee
A Chest	Cath,ha	Sun,dook	
A Door	M'lan,go	Ee,reed	
A Sword	Oo,pan,gan	Sey,eef	Sey,eef
A Table	Mey,zar	Oom,bar	Bur,shun
A Chair	Kee,tee		
A Cat	Par,kar	Moo,coolail	

English.	Souallie.	Soomallie.	Galla.
A Hog	Groo,wai	Keev,kee,nee	Golgah
A Fowl	Koo Koo	Do,vai	Loo,ko
A Cocoa-nut	Navzi	Koom,bee	Bud,dook
Yes	Geehee		
No	Ha,coo,nah		
Good, well	Ghem,ah		

[NOTE.—It is to be feared that many inaccuracies will be found in the above, owing to the indistinctness of the MS., and the impossibility of procuring a person qualified in the languages to revise the proof-sheets.]

I fell in with the coast of Africa in lat. 9 deg. 30 min. N., on the 25th January, and from hence southward examined it as well as circumstances would permit. On the 7th February, I anchored in Patta harbour, and unfortunately found the country distracted by civil dissensions, originating from two rival cousins, who each laid claim to the Sultanship. I found out the most popular, which happened to be the youngest, and on him I waited with my Government letters, accompanied by Lieutenant Hardy, commanding the *Sylph*, and Mr Whigham, my surgeon. I must have been three or four hours reaching town, and after as long a detention there, and receiving some menacing insults, which will be particularly detailed on my return, I escaped from these wretches, and reached the ship much fatigued, some time after midnight, having been six hours in the boat returning. Finding the disposition of the natives precluded the success of any inquiries I had to make, it was deemed advisable to quit the port; but another difficulty arose, which points out the cunning treachery of these people: we were now told the vessels could not go out through the S.W. channel, (the only condition on which I entered the harbour,) but must warp out the way we came in, (a thing impossible against the prevailing wind and sea,) or that we must wait the change of monsoon. Detecting their duplicity, I seized and detained two natives who were concerned in bringing us in, and after two or three days spent in buoying off a channel unknown to them, with the top of high water spring tides, grounding occasionally, we got the vessel providentially through the banks, and clear of Patta reefs, and then discharged the natives. Hence we proceeded southward along the coast, and on the 24th of February anchored in this fine harbour.

I waited on the Hakim, and was kindly received; but the general conduct of this personage has since proved very unaccommodating. I was desirous, during my stay here, of procuring a house for the purpose of receiving the visits of the well-disposed, and unsuccessfully applied to the Hakim for one, or the use of a French factory for a few days. I am told he forbade any one to furnish me, and has used every endeavour to keep visitors away from the ship. He is a person

warmly in the French interest, and derives great pecuniary advantages from the trade to this port. The welcome news of the capture of the Isle of France was brought here by the Surat vessels, which arrived in the middle of March. The Hakim would not credit the account, until it was confirmed by a ship from Muscat a few days ago.

The sum of the information I have been able to collect along the east coast of Africa, and at this port, is, I am sorry to say, very small. The first object of my search was Doara river, which I was not fortunate enough to fall in with, from the strength of the prevailing winds and currents; if it exists, it is doubtless a very small stream. Magadosho, in lat. 2 deg. 3 min. N., I could only ascertain the situation of; drifted past this. I hoped to see the town of Marca, but was disappointed. I have been informed that it is a very small village, less than Magadosho or Brava; that it has little or no trade. I arrived off the port of Brava in latitude 1 deg. 10 min. N., under the same impediments—a high wind and sea, and strong currents, but expected to find shelter from the plan I had of its harbour; however, in standing close in for the purpose of anchoring, I was disappointed to find it impossible to bring the vessels up, without imminent risk of parting and being driven on shore, which compelled me to haul off. I then looked for the river mentioned in my instructions, whose supposed situation was to be found in 5 min. N. lat., but I could find no entrance whatever in that parallel. The wind moderating on the line, I anchored the vessels on the eve of the 3d February, with a view of exploring the river called Dos Fuegos, and rendered into English by the late Captain Bisset, "Rogues River." During the night the *Sylph* parted her cable, and was driven past this entrance, whose situation I could only geographically ascertain. The town of Juba and the bar were distinctly seen in passing from hence to Patta. The coast is fortified by a chain of islands, mostly connected by reefs. Our transactions and inquiries at the latter port were checked by the unfriendly disposition of the natives. After clearing Patta, we proceeded southward along the coast,—ascertaining it, also the two points of Formosa Bay, the Leopard's Shoal, and the mosque near it, with Quiliffa River, the town and harbour of Mombas, the islands of Pemba (or Geddree, according to the Arabs,) and Zanzibar, and the site of the coast between these places.

My study has been to cultivate the friendship of all ranks, with a view of gaining information on the points Government have instructed me; and the result of my labours amounts to the following, the accuracy of which, as far as I can judge, there is no reason to doubt. The fate of our countrymen Park, Hoinemann, and their companions, was my first and most anxious inquiry, both at Patta and this place, but I have not succeeded in meeting with any person who has the least knowledge of them, and there is every reason to suppose their fate is entirely unknown on this coast.

The town of Magadosho * is not very considerable; it may contain

* No revenue collected by the Imaum.

150 or 200 houses, and from its mosques is very conspicuous from seaward. It has not any river near it, and has but little trade, probably on account of the badness of its port, which only affords shelter for boats within a reef fronting the town. The town of Marca* is small, and has no safe anchorage off it.

Brava town† is composed of about 100 huts, and is as defective in its port as Magadosho. They are severally governed by Soomallie chiefs.

The mouth of Rogues River, called Govinda by the Soomallies, Joob (Gibb) by the Arabs, and Foombo by the Souallies, in lat. 0 deg. 13 min. south, is a large extensive river, but on account of its shallow bar, boats can only enter it at high water : it has scarcely any trade but such as is carried on by a few small country boats, the natives on its banks being thieves inimical to all strangers. The next principal river, called Oazee, situated one day's journey south of the Isles of Patta and Lamoo, is also extensive, without trade. Quiliffa, the next, in latitude 3 deg. 26 min. south, is a large and deep fresh-water stream, with few inhabitants, and no trade. Foongaruy River, off the N.E. end of Zanzibar Island, is next ; it is in about latitude 5 deg. 45 min. south. Leefeege is another large river, opposite Moonfia Island ; and there is also a considerable stream off the port of Quiloa or Keelwa. Along this extent of coast are many minor streams, but not one seems to possess advantages as places of mercantile resort, or the Arabs would no doubt ere this have benefited by any trade they held out. The tides flow up the larger streams, one day's journey from their mouths, and it is confidently reported they all take their rise among the mountains in Abyssinia.

Five or six coss, or about one day's journey, at the back of the towns of Magadosho, Marca, and Brava, is situated a small stream called the Doho ; it does not join the Govinda, being lost among some hills before it reaches so far south. It appears to me to be (from the accounts of the reporter, an intelligent Soomallie,) a branch of the Zeebee, which he calls the Dawaha, where the Doho joins. The other and principal branch, he says, runs through Africa, and disembogues on the coast of Adel, near Burburreea.

The town of Gunnanee, on the right bank of the Govinda, is about four weeks' journey from Brava ; its inhabitants are Soomallies, and it is composed of about three hundred huts. Surat cloths are taken to it from the coast and exchanged for slaves, elephants' teeth, &c. There is another considerable village called Leeween on the left of the Govinda, some distance inland from that stream, inhabited by negroes of no professed religion. The Eesoomadoo Galla, a race of cannibals, the Oombaney, Howwahsow, and Arrooseeya Galla tribes, intermixed with Soomallies, inhabit the banks of the Dawaha, nearest the sea-coast ; they do not cultivate the ground, but subsist on milk, meat, and herbs. The Guracha Galla inhabit the interior south of the line, and the Borran

* No revenue collected by the Imaum.

† Camels numerous, at about 5 dollars each.

Galla north of the line; their language is nearly similar; they are represented to be cannibals, and cruel thieves. The inhabitants opposite Zanzibar are Wuddooa negroes; but there is reason to believe this part of the coast was formerly inhabited by the Guracha Galla, or, as my instructions style them, the Giagas. The Soomalliees inhabit the sea-coast from the equator north round Cape Guardafui to Burburreea and Zeylah; their possessions extend some distance inland. The Souallies, on the contrary, are confined close to the sea-coast, and inhabit that part of it from the line south to about Cape Delgado, tribes of Caffres occasionally intervening, particularly to the southward of Zanzibar. The various tribes of negroes brought to this port for sale are too numerous to describe; the principal are the Meeamaizees, whose country, at three months' distance, abounds in elephants' teeth, and some gold is found there.

The Muckwa, whose country is two months' journey distant from the sea coast.

The Meeyahoo is fifty days' journey off the Gooroo—is fifteen days' inland.

The Dohai, ten days' from the coast, are cannibals.

The Meegeendoo are situated one month's journey from the seaport of Quiloa.

The Jiggua, four days', and the Moozumbarree, three days', &c., &c. The interior is represented as a most fertile country, abounding in cattle and elephants.

I have not been able to gather any satisfactory information regarding the river Zambesi, its course, the town of Sofala, character of its natives, or description of the surrounding country. The Christian states of Yufat and Shoa, on the confines of Abyssinia, with the large towns of Timbuctoo, Cashna, and Hoossayee, said to be in the interior of Africa, or Ethiopia, under the government of Mussulman princes, together with the circumstances relative to the triennial voyages of Solomon's fleet from the Eslantic Gulf to Ophir, are unknown to the inhabitants of this place; nor have I yet met with one who could afford me any satisfactory accounts of the river Niger or Joliba, or the Nile of Soudan, or South Africa.

I have made lists of the Souallie, Soomallie, and Galla dialects, and shall add such others as I may be able to collect.

The coast from Cape Guardafui to Magadosho is arid and sterile; not a hut or boat was to be seen, although the sea-shore abounds with fish. From the latter place the land improves, and on the line it becomes completely woody, and so continues far to the southward.

The trade of this coast is chiefly in the hands of the Arabs from Muscat, Maculla, &c., and a few adventurers from Cutch and the coast of Scinde. The principal imports at Zanzibar are Surat cloths, to the amount of about twelve lacs of rupees annually, besides beads, cotton, sugar, ghee, fish, dates, and grain, and about two hundred candies of iron-bar, which is partly distributed for use along the coast. English

woollens are in no demand, consequently not imported. The exports are slaves, elephants' teeth, raw dammer, rhinoceros' hides and horns, cowries, wax, turtle-shells, coir, cocoa-nuts, &c. The duties collected here on merchandise here are said to amount to about one and a half lacs of dollars annually; but as imposition and extortion are occasionally resorted to, they may be considerably more. The Imaum of Muscat receives from hence a clear sum of 60,000 dollars, and yearly makes an additional levy on various pretexts. The following is a list of trading vessels at Zanzibar at the end of March 1811:—Two ships, two snows, three ketches, twenty-one dows, fifteen buglas, four dingeys, ten small boats of all sizes, besides a variety of country boats constantly arriving and departing, and two large boats building. Some seasons upwards of one hundred large dows, &c., have been known to arrive at this port from Arabia and India, but its trade appears on the decline, while that of the ports of Mombas and Lamoo, belonging to independent Arab chiefs, is annually improving, although, as harbours, they do not possess near the advantages that Zanzibar does.

The dress of the people, in general, is a coloured wrapper round their loins. The better sort have, in addition, a loose white cloth over their shoulders, and round their body. The Arabs wear turbans, while the Souallies, Soomallies, and negroes go bareheaded.

The port of Patta, in latitude 2 deg. 8 min. south, has little or no trade, on account of the intricacy of its harbours, and the nefarious conduct of its inhabitants.

It would appear the Surat traders are subject to much imposition and extortion at Zanzibar, as the Hakim, over and above the usual duties of 5 per cent., seizes such part of their cargoes as he fancies; and the maquedahs of the three vessels now here have declared to me that in collecting the duties on Surat goods imported, he is not guided by any invoice prices, but fixes a valuation on them far below the prime cost from the hands of the manufacturer; and as he (the Hakim) pays himself in kind, takes good care to detain for his own use such articles as are most saleable at the time, by which means the merchant pays on an average 15 per cent., and sometimes more, beyond the established rates fixed by the Imaum of Muscat.

(Signed) THOS. SMEE, *Commander.*

On board the H. C.'s Ship "TERNATE,"
Zanzibar Harbour, 6th April 1811.

Particulars concerning the great River Gochol, and the Countries adjacent thereto, from native information collected in the Kingdom of Shoa. By Capt. W. C. HARRIS, of the Bombay Engineers. May, 1842.

(*Presented by Government.*)

THE Gochol is a vast river running from west to east, through the eastern portion of Africa, and taking its principal source in the

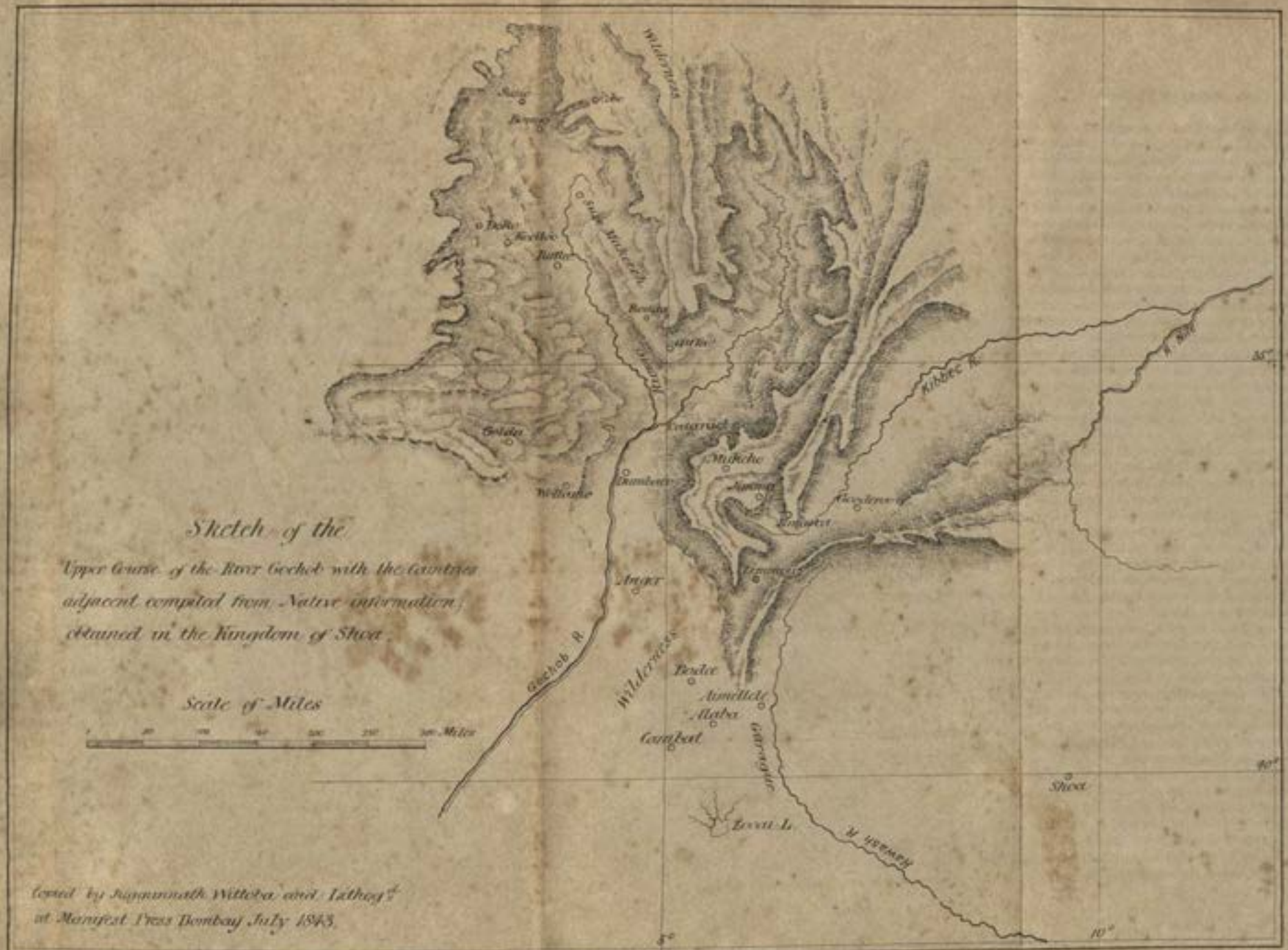
highest mountain land lying north of the equator. Fifteen days' journey south from Enarea it is joined by the Omo, a large tributary, which rises beyond Tufftee, in Susa Maketch, a fountain or jet of water described to play the height of a spear-shaft. Half a day's journey below the point of junction, the united volume of water, forming a stupendous cataract called Dumbaro, the roar of which can be heard many miles, expands to the breadth of about four miles, and, pursuing its rapid course to the southward, forms the southern limit of Zingero, which province is visible from the high land in Enarea.

The Gochol is, in all probability, the "Bargamo" or "great water," from beyond which the Galla describe their forefathers to have come. Having been probably driven from the vast unexplored interior by the great centrifugal force, yet unexplained, they poured from the south into the country vacated after the defeat of the invader Gragné, by Don Christopher de Gama. Throughout the region included between the Nile, the Hawash, and the Gochol, which may probably be termed the Galla country, no other language is spoken; whereas, to the south of the river last named, the new population having become gradually incorporated with the aboriginal possessors of the soil, have lost their own language.

The mountainous peninsula, formed by the junction of the Omo with the Gochol, is termed Caffa, an independent pagan country, over which presides Balee, the queen of King Hollaloo, who died a few years since. Beyond Caffa lies an extensive wilderness, which probably divides the barren country of Nigritia from the fair provinces occupying the elevated land. Seneca relates, that two centurions, who were sent by Nero Cæsar to explore the head of the Nile, were recommended by the King of Ethiopia to the nearest kings beyond that country, and after a long journey came even to the further countries, to immense morasses, the end of which neither the natives themselves did know, nor anybody may hope to find.

The Gochol is crossed by means of rafts belonging to the Queen of Caffa. They are capable each of containing from thirty to forty persons, and are formed of the trunks of large trees lashed together with strips of raw hide, and surrounded by high gunwales of the same construction; the helm being a moveable spar, unaided by oars or other propelling power. The passage, accomplished by the current, often occupies an entire day in fair weather, whilst in foul it is extended, as might be conjectured, to two and three; the rafts being often obliged to put back from stress of weather.

Balee is represented to be a young woman of extraordinary energy and ability, very hospitable to travellers, who visit her with blue calico, beads, and trinkets; in return for which she gives cloth and other produce of the country. On the demise of her husband she assembled all the governors of the different provinces, and, having caused them to be put in irons, proclaimed herself queen. Her only son, Gomarra, still a youth, leads the army into the field; but she


Sketch of the
Upper Course of the River Gochob with the Countries
adjacent compiled from Native information
obtained in the Kingdom of Shoa.
Scale of Miles
Miles
Wilderness
Gochob R.
Kibbec R.
Wilderness
Garague
Hawash R.
Shoa
Anger
Bodee
Aimellele
Alaba
Combat
Zooai L.
Golda
Wollamo
Dumbaro
Mukcho
Gooderoo
Limmoo
Kaffa
Boodo
Sugu Makeeth
Doko
Keelloo
Ruffa
Sugu
Bonga
Coba
35°
40°
5°
10°
Copied by Juggunnath Wittoba and Lithog.d
at Manifest Press Bombay July 1843.

often goes in person, and always plans the expedition herself. Whenever she moves abroad, her subjects are bound to spread the way with their raiments; and as well during the administration of justice, which she does from behind a screen with a small aperture, as during her meals, drums, fiddles, and flutes play incessantly.

The principal towns of Caffa are,—Nyhur, Moyey, Ziggahan, Boora, and Alera. The provinces of Dumbaro, Wullamo, Bouga, Wurretta, and Tufftee, are all tributary to the Queen, and pay chiefly in gold obtained from the lower countries. The Golda negroes, who go perfectly naked, are likewise tributary. The whole country is extremely mountainous, and clothed with thick forest. The inhabitants reverence Friday and Sunday, as do the Galla, and like them celebrate the festival of St Michael by a great feast; but the language, which is common also to Gobo, Tufftee, and Dumbaro, is quite distinct from that spoken by the Galla.

The married men and women of Caffa live apart during the day, and although residing under the same roof, never see each other until dark. Should the husband require anything, he durst not seek it in the interior of the house, but utters a peculiar note, when the wife, without exhibiting herself, deposits what is wanted on a neutral spot and retires. Both sexes have one public meal during the day, but they never intermix or are seen by each other. If the woman be accidentally perceived by her husband during the day, he cries aloud, "By the life of the Queen!" and, taking his erring spouse before the royal tribunal, complains that she has seen him eat and smoke, whereupon she is sentenced to imprisonment for three years.

The Gobo occupy the extensive wilderness beyond Caffa; and southwest thereof is a red nation called Susa, who are at constant war with them. Beyond these, again, are the Doko, a pigmy and perfectly wild race, not exceeding four feet in height, of a dark olive complexion, and in habits closely approximated to the "beasts that perish." My principal informant, a native of Enarea, one of a caravan of three hundred merchants from that province, after trafficking six months in Caffa, went on thence to the Doko, for the purpose of kidnapping slaves. From Caffa he proceeded to Bouga, five days' journey, of about ten miles each; thence to Tufftee, ten days' journey, crossing the Omo river by a rude wooden bridge sixty yards in length. From Tufftee to Kooloo, seven days', and thence to Doko, one day more. The whole road ascended through forests and mountains uninhabited, and swarming with wild beasts—elephants and buffaloes especially.

The Doko country is clothed with a dense forest of bamboo, in the depths whereof the people construct their rude wigwams of bent canes and grass. They have no king, no laws, no arts, no arms; possess neither flocks nor herds; are not hunters, and do not cultivate the soil: but subsist entirely upon fruits, roots, mice, serpents, reptiles, ants, and honey, both of which latter they lick from off their arms and hands. They catch serpents by whistling to them, and having torn

them piecemeal with their long nails, devour them raw, fire being unknown in the country; but, although the forests abound with elephants, buffaloes, lions, and leopards, they have no means of destroying them. A large tree, called toko, is found amongst many other species, attaining an extraordinary height, the roots of which when scraped are red, and serve for food. The principal fruits are the yebo and meytee, to obtain which the men and women, not excepting those of the latter who are pregnant, ascend the trees like monkeys, and in their quarrels and scrambles for the fruit frequently throw each other down from the branches.

Both sexes go perfectly naked, and have thick pouting lips, small eyes, and flat noses. The hair is not woolly, and in the females reaches to the shoulders. The nails, never pared, grow both on the hands and feet like eagles' talons, and are employed in digging for ants. They perforate the ears in infancy with a pointed bamboo, so as to leave nothing but the external cartilage; but neither tatoo nor pierce the nose. The only ornament worn is a necklace, composed of the spinal process of a serpent. The men have no beards. The hair does not turn gray with age, nor do they become blind; and sickness being unknown in the country, they die usually a natural death, falling, like the autumnal leaves, when the number of their years is accomplished.

The Doko have neither idols, temples, nor sacred trees; but they possess a glimmering idea of a Supreme Being, to whom, in misfortune, such as any of their relatives being slain, they pray, standing on their heads, with their feet resting against a tree—"Yere, if thou art, why dost thou suffer us to be killed? We are only eating ants, and ask neither for food nor raiment. Thou hast raised us up, why dost thou cast us down?"

Marriage being unknown, sexual intercourse is promiscuous. After the birth of a child the mother soon accustoms it to ants and reptiles, and abandons it the moment it is capable of shifting for itself. Prolific, and breeding like wild beasts, their country affords the very seat of slavery. Although situate on one of the highest culminating points of Northern Equatorial Africa, its proximity to the equator renders the climate rather warm than cold. The seasons are extremely wet, the rains commencing in May, and continuing without the slightest intermission until February. No great rivers, however, take their source in the country, which doubtless forms the separation from Nigritia.

The slave-merchants of Enarea go in large bodies, and, holding a gay cloth before their persons, dance and sing in a peculiar manner, when the ignorant and defenceless Doko, knowing, from sad experience, that all who attempt to escape by flight will be ruthlessly hunted down and perhaps slain, tamely approach and suffer themselves to be taken; the cloth being cast over their head. They are most frequently found in high trees, and enticed down by the offer of ants, reptiles, and salt. One hundred merchants can thus kidnap a thousand Doko, and from their ignorance of the countries beyond their own, the captives make

no attempt to escape. They are nevertheless tied up until accustomed to eat bread, to which at first they display a great aversion, as also to any food which has undergone a culinary process; and long after their enslavement they are prone to their old habits of digging for ants, and searching for mice and serpents. On account of their docility and utility as servants, as well as of their few wants, none are ever sold by the slave-dealers of Enarea out of that country. The Koolloo and Dumbaro are the only other people who make inroads upon the Doko, fierce and bloody struggles often taking place between these hunters of men, amid the dense forests of bamboo, the creaking of which are represented to be loud and incessant.

The Doko are undoubtedly the pigmies of the ancients, who describe them as found only in tropical Africa; and it is a curious fact, that the people of Caffa represent their forefather "Boogazie" to have issued from a cave in the forest,—a tradition which calls to mind the Troglodytes, also described of old as inhabitants of this portion of the continent. Between Metcha, where the forest-land commences to the southward, and Garro, is a small tract peopled by Christians, who reside entirely in caves among the mountains. Until very lately this isolated remnant of the ancient Ethiopic nation was unheard of, as were twelve isolated Christian churches, discovered a few years back upon the conquest of Yeya, by Sahela Selassie.

The kingdom of Enarea is from fifteen to twenty days' journey N.E. of Caffa, through the Muncho and Jimma tribes lying on this side of the Gochol. Near the cataract of Dumbaro the road is perilous to single travellers—the Dumbaro lying in ambush in order to kidnap or murder them. Enarea is represented as an extensive plain or table land, surrounded on all sides by lofty mountains, producing corn and cattle in abundance; and the separation of the waters to the north and south taking place here, it must necessarily be among the most elevated countries of Africa. The principal range is Menchillo, running from east to north-west, and with a spur from east to south-west, joining the mountains of the Moon. Saka, the capital, contains from ten to twelve thousand inhabitants, mixed Pagans, Mohammedans, and Christians. The king, Abba Bokibo, a pagan, is represented as a just and merciful monarch, although his father Bofo Boko (the serpent of Boko,) and his grandsire Ratchanee, were both great and bloodthirsty tyrants, who slew the people like cows. It is the royal prerogative to wear a black mantle coarsely woven of goats' hair, similar to the cloth employed in the manufacture of the king's tents in Abyssinia. His majesty dispenses justice in the market-place, sitting on the trunk of a tree, with a skin spread beneath his feet. The natives inter their dead, but the bodies of criminals who suffer capital punishment are cast out to the hyænas. Governors are distinguished by striped raiment during the military expeditions, which are frequent, and last usually from eight to ten days; each soldier carrying a small supply of bread, and subsisting by pillage and plunder. Many bloody battles

are annually fought with the surrounding hostile tribes; the warriors carrying three throwing spears and a circular buckler with a sword, which is resorted to in close combat. The Badee Galla are tributary to Enarea, but those of Muncho are independent, and at constant war with Caffa.

Little sickness of any sort prevails in Enarea, and mendicants, the pest of Abyssinia, are unknown in the land. The houses, of a circular form, resemble those of the Amhara, but are better constructed. The wild vine flourishes and bears abundance of grapes; and the gosso tree, which attains a vast height, is covered during the season with delicious blackberries. The natives fasten the tendrils of the vine around the trunk, and thus ascend. Coffee grows wild in the woods to the height of eight or ten feet, and bends under the load of fruit. A large skin-bagful is sold for an amolee (2½d.) It flourishes spontaneously in Caffa also, and among all the surrounding tribes, though not in such luxuriant abundance. The Dumbaro do not drink coffee, but in Enarea it is prepared as in Europe, and always presented to the stranger. There is besides a tree like the tea-plant growing wild, and called that, which is used by the people of Dumbaro, who both chew the leaves and drink an infusion of them in boiled milk.

Throughout Tufftee and Dumbaro horned cattle are abundant, but in Caffa they are so scarce that the soil is dug with the spade instead of being tilled. Wheat, maize, barley, and a coarse species of kale, called goomun in Abyssinia, are widely cultivated, both in Caffa and Enarea, between which countries there is a considerable trade; cloth and slaves being obtained from the former in exchange for horned cattle, horses, mules, civet, copper, and the merchandise of Gondar. A good cloth is purchased in Caffa for a piece of salt, value 2½d. sterling. The people of Enarea employ myrrh in their religious ceremonies, offering burnt-sacrifices of this incense to their guardian genius; and this gum, together with frankincense, which is employed in funeral obsequies, and in the fumigation of houses, is procured from Zingero.

Civet is extensively used as a perfume; the cats, of a very large size, being caught in gins, and commonly kept in the houses of the inhabitants, where they are fed on meat and boiled maize, and daily placed in cages before the fire, when the operation of removing the secretion is performed with a wooden spoon—a lump the size of a small filbert being yielded at each baking.

Simmon, whereof the capital is Sobicha, is a province annexed of old to Enarea, and in its forest rises the Kibbee, across which is a wooden bridge. This river is larger than the Hawash, and instead of flowing east, as represented by the extant maps of Africa upon the authority of the Portuguese, takes its course north-westward, joining first the Dambee, then the Dirdeza, and ultimately becoming tributary to the Nile,—of this fact there is no doubt. The people of Timmo and Simmon uniting, made last year an inroad into Zingero, which is two days' journey below, and was constantly at war with Enarea. Having

dethroned Amo, the ruling king—who was a very brave warrior—they appointed a governor in his room, since which period that ancient principality has become a dependency of Abba Bokebo, and pays annual tribute in cloth, frankincense, and myrrh.

The capital of Zingero is Anger, situated on the summit of a very high mountain; and the whole country, which extends at a much lower level, is rich and fertile. In the days of its independence the succession to the throne was determined from amongst the nobles, who, on the death of the monarch, assembled in an open field, when he over whose head a bee or a vulture first chanced to fly was elected by the unanimous voice of the people. Although no portion of the population professes the Christianity of Ethiopia, and none of its fasts are observed, the rite of circumcision is universal, and Sunday is respected, together with the festivals of Kidana, Meherat, and St Michael. The mammæ of male children are amputated, from a belief that no warrior can be brave who possesses them, and that they should belong only to women. This statement is fully corroborated in the persons of the few male prisoners of war who reach this kingdom from Zingero, the greater number committing suicide the very first opportunity, and being therefore considered hardly worth exporting.

The practice which obtains in Zingero of selling no male slave who has not been taken in battle, is said to have originated from the following circumstance :—One of the kings of old commanded a man of rank to slaughter his wife, her flesh having been prescribed by the sorcerers as a cure for some malady wherewith his majesty was afflicted. Returning to his house for the purpose of executing the royal mandate, the noble found his fair spouse sleeping, and his hand refused to perpetrate the murderous deed. Hereat the king, waxing wroth, ordered the lady to slay her husband, which she did without hesitation, and thus brought odium upon the whole sex, who have since been considered fit only to become slaves and drudges.

Human sacrifices are frightfully common in Zingero; when exporting slaves from that country, the merchants invariably throw a female into the Lake Umo, in form of a tribute or propitiatory offering to the genius of the water. It is the duty of a large portion of the population to bring their first-born to the king as a sacrifice to the deity, a custom which tradition assigns to the advice of the sorcerers. In former days it is said that the seasons were jumbled; there was neither summer nor winter, and the fruits of the earth came not to maturity. Having assembled the magicians, the king commanded them to show how this state of things might be rectified, and the seasons be reduced to order. They advised the cutting down of a certain great pillar of iron which stood before the capital, the stock whereof remains to the present time; this had the effect desired, but, in order to prevent a relapse into the former chaos of confusion, the magi directed that the pillar might annually be deluged in human blood, and a tribute was therefore levied upon the first-born, who are immolated upon the spot.

Cambat is a small mountainous province, lying north-east of Zingero and south-east of Enarea, about six days' journey from Aimellellee. With the exception of a few Mohammedan merchants, this independent state is inhabited solely by Christians, who have fifteen churches, but are without priests. The capital, Karemza, is constructed on a high hill of the same name, and the king, Degoyey, who is extremely advanced in years, is represented as a just and upright ruler, very hospitable to travellers, and a great warrior. Between Aimellellee, which is a dependency of Sahela Selassie and Cambat, the road passes through the Adeea and Alaba Galla, the latter governed by a queen, whose notorious treachery renders the passage unsafe.

Wallamo is an adjacent Christian province under an independent sovereign, the exact position whereof is not well ascertained, though it is known to be east of Zingero, below Cambat, and at war with both these states. The country is extremely mountainous, and the inhabitants, who are purchased for twenty pieces of salt, and occasionally brought by slave-dealers to Shoa, are of fair complexion, and speak a distinct language. The capital is Wafana, and the province is watered by a considerable river styled Ooma (Omo ?)—the surrounding tribes being the Roolloo, Woradda, Simmon, Assoo, and Jimma. Eight days' journey beyond Zingero is the country of Mager, the king of which, Degaie, is represented to be a very powerful monarch. The inhabitants of Koorchassi and Sidama are Christians, surrounded on all sides by heathens. In the former province rises a great lake styled Wabi.

The following are the animals said to be most common in the countries bordering on the river Gochob :—

The Boyé, a beast about the size of an ass, with cloven hoofs and hair like that of a red cow, a thin tail with a black tassel, and long projecting cross teeth. It holds its head low, and never looks upwards, is very fierce, and strikes always at the knees. It is found in the forest in families of five or six, and of its hide the best shields are manufactured.

The Wurseza, an herbivorous animal, the size of a calf, with four horns turned backwards ; a black back and white belly. It is found in the wilderness of Beyko, towards Gooderoo, a very feverish tract, abounding with wild beasts. To have slain a Wurseza is esteemed a great honour.—The Borofa, the size of a sheep, with large horns. It leaps and stops, and its speed is immense, but the natives encircle it on horseback.—The Worubba, as large as a donkey, with horns curved backwards, and very full, brilliant eyes ; it is extremely timid.

The Adoo, of the cat-tribe, as large as a lioness ; very lank and active, of a cream colour, with spots on the face, and a very long ringed tail, which, when the animal is couched in ambush among the brushwood, is to be seen flourishing aloft. It springs suddenly on its prey ; and often carrying off men, is more dreaded than any other wild beast.

The Amakeda, in size and colour resembles a lion, but is different in

other respects. It is very active, and leaps over the highest fence. Found chiefly in Caffa.—The Avoldigiza; as large as a donkey; of a black colour. It burrows in the ground, and lurking in holes, springs suddenly upon its prey.

The Yiyee, the size of a dog, cries like that animal, and abounds on the road to the Gochob. It lives in holes, hunts in large packs, and attacks even the buffalo with success.—The Chunno is black, and lives in trees in the forests of Enarea, leaping from tree to tree, subsisting on fruits, and when hunted emitting a fœtid smell with a loud noise.

White buffaloes and elephants are found, the latter of the colour of a leprous skin; but no one is permitted to destroy them, or generally any white animal, from a superstitious belief that they are the protectors of the human race.

(Signed) W. C. HARRIS,
Captain, Engineers;
On special duty at the Court of Shoa.

Remarks on the North-east Coast of Africa, and the various Tribes by which it is inhabited. By Lieutenant C. P. RIGBY, 16th Regiment Bombay N.I. March 1843.

(*Presented by Government.*)

It has justly been remarked with regard to the north-east coast of Africa, that there is scarcely an equal extent on the globe respecting which so little is known. Although this ignorance has doubtless arisen partly from the barren and inhospitable nature of a considerable portion of the country, and the savage and barbarous character of most of its inhabitants, yet a great part of it is known to be highly productive, which has from the earliest times furnished many valuable articles of commerce, and has carried on a very extensive trade with the various ports of the Red Sea, Persian Gulf, and India.

Whilst in every other part of the African continent the enterprise of travellers or the zeal of missionaries has successfully traversed the most arid deserts, and penetrated far into the interior, the whole of that vast tract stretching from the south of Abyssinia and the Straits of Babel-Mandeb to the Mozambique, remains a blank on our maps.

Possessing, as we now do,* a mission established in the heart of Abyssinia, and a commercial depôt at Aden, where several hundreds of men of the various Somauli tribes, who inhabit the opposite coast, have become settled subjects, with a trade also fast rising to importance at Zanzibar and the neighbouring coast, we may venture to hope that this ignorance will be dispelled, that our knowledge of this interesting

* This was written before the return of Captain Harris and his party.—ED.

country will be increased, which, from its known fertility and extent of its natural resources, offers an enlarged field for commerce.

Having, through the kindness of the Secretary of the Bombay Geographical Society, been favoured with the perusal of the papers of the late Lieutenant Smee, who was in the year 1811 sent by Government to explore the eastern coast of Africa, and he having also requested me to extract such parts as, added to other sources, might be deemed interesting, I have copied such parts of Lieutenant Smee's journal as at this distance of time may be thought to possess sufficient interest, especially his description of the island of Zanzibar. I have also added such information as I was able to obtain from Abyssinians and Somaulies at Aden, and extracts from Wilford's learned essay on the Hindoo knowledge of the countries bordering on the Nile, published in the 3d Vol. of the Asiatic Researches.

The information obtained by Lieutenant Smee is extremely meagre and scanty; the ill-feeling of the natives, promoted at that time by the French slave-dealers who traded to the ports on the east coast of Africa, having prevented their examining many places and fulfilling the objects of the expedition.

The only account that I have met with of Europeans traversing any part of the country in the neighbourhood of Cape Guardafui, is a narrative written by an officer of the ship *Fazy Allum*, which was wrecked there when returning with troops from Egypt in 1801, when most of the crew perished from hunger, fatigue, and the attacks of the natives; some of them, however, made their way from the south of Cape Orfoy, passed Cape Guardafui, and reached in safety Bundee Allulah and Bundee Felix, where they were kindly treated, and remained nearly two months. They found good wells on the road, and represent the people at Bundee Felix and Allulah as being kind and hospitable. Lieutenant Smee's journal commences with part of the Somauli coast to the north of Cape Guardafui, of which he remarks, that it is uniformly desert and barren, "even on the sea-coast, where the abundance of fish would render the means of subsistence easy to be obtained, not a boat or hut was to be seen throughout its whole extent—a strong proof of the country near the coast being destitute of the materials requisite for constructing these necessaries. The few inhabitants probably belong to the Somauli tribes, whose limits of residence are said to extend to the Line." Lieutenant Smee does not appear to have been aware that the scanty population in the vicinity of this coast is not caused so much by the inability of the soil to furnish the means of subsistence as from the baneful effects of the hot winds and hot season, which compel the inhabitants to retire during several months of the year to the high land in the interior. Being also of nomadic habits, the Somauli tribes have no settled habitations, moving about with their flocks and herds, the principal source of their wealth, for the convenience of pasturage.

To the south of Cape Guardafui is that part of the coast known to the English by the name of Azan or Ajan, and called by the Arabs

"Berr-el-Somal"—the country of the Somaulis; it is represented as barren and desert, occupied principally by the Somaulis and the wandering tribes of Sowahilis—a degraded barbarous race—who are supposed to be sprung from the Galla negroes and Arabs, and, as their name implies, occupy only the sea-coast from Cape Guardafui nearly to the 20th degree of south latitude; the flat nose and thick lips sufficiently mark their negro origin, whilst their name being of Arabic derivation (Sowahil being the plural of Sahila shoee) would imply their connexion with the Arabs; the colour of their skin varies from a reddish-brown or tawny hue, like that of the Arabs, to the deep black of the negro; they have short woolly hair, and are looked upon by the surrounding nations as a race of slaves,—the term "Abed" by the Arabs, and "Bidod" by the Somaulis, both words signifying slaves, being commonly applied to them as a reproach. The country behind them is inhabited by the various tribes of the Galla nation, who are scattered over a great portion of the African continent, and are doubtless the aboriginal race of Central Africa; they are found in separate independent tribes over nearly the whole of Abyssinia, and to the south of the equator on the eastern side, also interspersed over the wide tract inhabited by the Affer or Adel; the Somauli and Sowahili tribes waging unceasing war with all the surrounding nations, they have hitherto preserved their independence, whilst their ferocity and cruelty cause them to be equally dreaded by all; they generally occupy the most inaccessible parts of the country; they have one common language, and although surrounded by Mohammedan and Christian nations, they have, with the exception of a few tribes in the south of Abyssinia, preserved their own pagan religion, which, in many respects, resembles that of the Caffres. They have an idea of a Supreme Being, called in their language Wâk, to whom they pray for the accomplishment alike of their blessings and their curses. Their principal occupations are agriculture and tending their cattle; but those on the eastern coast trade with the Arabs and Sowahilis, principally providing the ivory and produce of the interior. Mr Krapf, who has resided several years in Abyssinia, gives a list of more than fifty different tribes of Gallas, residing in and around the kingdom of Shoa; beyond the limits of Abyssinia they also exist in great numbers, and are neither so savage nor barbarous as those towards the eastern coast. Mr Krapf, who has visited some of their tribes, mentions that the Moolofallada tribe of Gallas are governed by a queen, a woman of great spirit, named Tshami, who, when repeatedly requested by King Sahela Selassie to visit him at his capital, Ankobar, replied, "that if he wished to see her at his capital, it would become him as a king to overlay all the road from Moolofallada to his palace with silk and velvet, as she would certainly have done had she invited him to visit her country." The Anko Gallas, also, to the north-west of Shoa, were governed by a queen. Part of the province of Amhara also, comprising the country on the west of the river Tecasse or Tenesh Abai, has, since the beginning of this century, been subject to a Galla

family, that of Ras Guxo, of whom the tutor of the nominal king of Gondar or Upper Abyssinia is said to be a descendant. Great numbers of Gallas of various tribes are annually sold as slaves, and in fact principally supply the slave markets of all that part of Africa, maintaining a continual warfare with the Abyssinians. The latter make annual forays into their country, seizing all they can, to be sold as slaves, and driving off their flocks and herds: no wonder, then, that the unfortunate Gallas retaliate on every opportunity, and hence have acquired that character for ferocity and cruelty which has been caused by the barbarous conduct of their neighbours towards them. The females of the Galla race of Abyssinia are greatly prized in the markets of Egypt and Arabia for their superior beauty and fairness of skin, and they always realise a much higher price than slaves of any other tribes exported from the African coast.

The Gallas on the eastern side are divided into two great divisions, the Borran Galla, who inhabit the country to the north of the equator, stretching from the eastern coast as far as the southern districts of Abyssinia; and the Carratche Galla, who occupy the country to the south, behind the Sowahili tribes. These two divisions, however, do not differ much in person, language, or manners.

According to their own traditions, the Gallas have always dwelt on the shores of the Abai or Nile; others relate that their ancestors came from the south, and spread themselves over the countries to the north and east, which they now inhabit.

The principal towns inhabited by the Sowahili tribes on the eastern coast, are Magadosho or Mukdeesha, situated in latitude 2 deg. 3 min. north, and longitude 45 deg. 42 min. east; Brava, situated in latitude 1 deg. 11 min. north, longitude 44 deg. 9 min. east; Juba, situated at the mouth of the river of that name; and Patta, which is their principal place, situated in latitude 2 deg. 8 min. south, longitude 41 deg. 13 min. east; variation 13 west according to Smee.

The language of the Sowahilis bears no resemblance to that of the Gallas, Somaulis, or Danakilli, (Affer or Adel tribes.) I have appended specimens of the Sowahili, Galla, and Somauli languages on the eastern coast, from a collection of words made by Lieutenant Smee; specimens of the Galla language towards Abyssinia by Mr Krapf; and also of the Somauli and Dankalli languages bordering the Gulf of Aden and the Red Sea: the Sowahili language contains many Arabic words, affording another proof of their origin being derived from that nation.

Magadosho or Mukdeesha.—The town of Magadosho or Mukdeesha was visited by Lieutenant Smee: he describes it as being large and irregular, situated on an uneven sandy piece of ground close to the beach, the land being considerably lower than that on either side: the houses resemble those seen on the coasts of Arabia and Persia, and are built of stones and mud, of a low square form, with small doors and windows, and have all flat roofs. The most conspicuous objects are

four mosques of considerable height, towering above the town; the land both to the N.E. and S.W. is high, of a reddish colour, thickly covered with black spots and low spreading trees, which have a very uncommon appearance. About ten miles to the south is a remarkable white sandy hill, which, with a hill or long ridge of an uncommon red colour, a little to the north of Cape Bassas, are excellent marks in approaching Magadosho. The sea-shore immediately opposite the town is sandy, guarded by a reef which, running from the rocks on the N.E. to the S.W. end of the town, extends about a quarter of a mile from the beach: within the reef the anchorage is said to be excellent. To the S.W. as to the N.E., the shore is in many places low and rocky, forming a number of small islands, the commencement of the chain which extends to the south beyond Patta.

Brava.—The town of Brava is situated under some very high reddish land, spotted with black rocks, and has several small islands abreast of it, at a very short distance from the shore, on one of which to the southward, opposite a white sandy patch of high ground, is a tower or lighthouse. The land between Magadosho and Brava is uniformly high, and has a remarkably reddish spotted appearance. The houses of Brava are similar to those of Magadosho. The coast from Brava to Patta is faced by one continued chain of islands, some of which are large and wooded, others very small. They are sometimes connected by reefs of rocks, over which a high surf beats, and a sandbank surrounding them extends their whole length, frequently stretching a considerable way out to sea. In one place, about twenty miles south of Juba, even to seven or eight miles opposite, is a remarkably high insulated rock, appearing like a square tower; here, also, the reef stretches a long way out, perhaps to the extent of five or six miles. Although there are no soundings close to the edge of this bank, the water has a remarkably white colour, resembling that often seen at the mouths of large rivers. The land on this part of the continent is in general moderately high, and almost universally covered with wood; the shore shelves to a smooth sandy beach, which is guarded by the islands and reefs already mentioned.

Lieutenant Smee remarks, "That part of the coast of Africa, stretching from the equator south, promises, in its aspect, something very interesting to the enterprising investigator. The numerous richly clothed islands which line the shore, separated by beautiful and frequently spacious inlets, and bounded behind by a delightful continent, rich in all the charms of luxuriant vegetation, present to the eye a prospect extremely enchanting, and would seem to indicate a degree of natural wealth equal to the most favoured regions of the known globe. Nothing could form a more striking contrast with that in view, than the barren coast to the northward of Juba." It must be a matter of surprise that a promising fertile country, such as is here described, should be so little known at the present day: that it formerly was the seat of a flourishing and extensive trade, and a commercial and enter-

prising people, is beyond a doubt; for without considering what truth may be ascribed to the opinion of many learned men,* that the famous ports of Tarshish and Ophir were situated on this coast, we know, that in the fifteenth century it formed a striking contrast to every other known part of the African continent, in having, solely by the skill and industry of its inhabitants, unaided by European influence, handsome cities, the buildings of which were of cut stone. When Vasco de Gama first arrived at the city of Malinda, the ruins of which are situated on the south-west side of the Bay of Formosa, he had the satisfaction of discovering there, as well as at other places where he touched, people of a race very different from the rude inhabitants of the western coast of that continent, which the Portuguese alone had hitherto visited. They were found to be so far advanced in civilisation, and acquaintance with the various arts of life, that they carried on an active commerce, not only with the nations on their own coast, but with the remote countries of Asia. Conducted by their pilots, he sailed across the Indian ocean, and landed on the coast of Malabar.

The Portuguese appear to have duly appreciated the value of having a settlement on so fertile and flourishing a coast, for in less than seven years after the discovery of the passage round the Cape, they had wrested both Malinda and Mombas from the native princes; but the blighting and bigoted rule of the Portuguese soon caused the commerce of both places to decline; and in less than a century after its conquest, Malinda had ceased to be a place of any importance.

Vasco de Gama visited Mombas also on his way to India; and on viewing the handsome stone buildings, the terraces and windows, almost imagined it to be a European town. Lieutenant Smee says, "The town of Mompass, as the natives call it, was abreast of us, distant two miles. The fort stands at a short distance from the shore, on a steep woody ridge, said to be an island, and has three flag-staffs on it: a little to the N.E. three remarkable hills serve as good marks for finding the place. Its situation is in lat. 4 deg. 2 min. south, long. 39 deg. 41 min. 30 sec. east." Owen gives the position of the fort, lat. 4 deg. 4 min. south, long. 39 deg. 38 min. east; variation 11 deg. west. He says, "Perhaps there is not a more magnificent harbour in the world than Mombas, (Mompass;) it possesses good riding ground at the entrance, sheltered by an extensive reef on either side—an anchorage which, from its vicinity to the coast, constantly enjoys the sea-breeze, and a steep rocky shore, in many places rendering wharves unnecessary, and in others forming a shelving sandy strand, where vessels can be hauled up and careened, favoured by a tide rising twelve or fourteen feet.

The island is three miles long by two broad, capable, by very little labour, of being rendered almost impregnable, Nature having formed it like a huge castle, encircled by a mote, over which, at the back, there is but one dangerous ford, passable only during low-water of spring-

* D'Anville, Robertson, Bruce, &c.

tides. The surrounding country is fertile and healthy, there being no swamps nor stagnant pools. The surrounding country is inhabited by the Sowahilis, who cultivate the sugar-cane; various grains, abundance of vegetables, and nearly every kind of fruit peculiar to tropical climates, are procurable, many of them growing spontaneously.

Patta.—Lieutenant Smee describes the town of Patta as standing on a low square island between two salt-water creeks, surrounded with woods, chiefly of cocoa-nut trees. It is composed of wretched mud buildings; fresh-water is very scarce. The sheep, which are covered with hair instead of wool, and the goats are excellent. The Sowahili inhabitants are cunning and treacherous to the last degree. It has very little trade; it was formerly much resorted to for cowries, but the trade has now declined.

The island on which the town of Patta stands is bounded by hills, and divided from the mainland by a narrow sandy creek, through which boats only can pass to the town, and thence to the Bay of Patta. Little of its early history is known, except that it was a place of much greater importance formerly than at present; the ruins of a castle built by the Portuguese are still visible.

Pemba.—Pemba, called by the Arabs "Al Khuthra," or the Green Island, is a low even island of considerable extent, being perhaps 16 or 17 leagues in length. It is entirely covered with wood, and is well peopled. The shore is generally low and steep to the water's edge, shelving in some small spots to a sandy beach, remarkably white, that at a distance appear like walls or portions of buildings; throughout its whole extent are numerous creeks or inlets, and towards the south-west end is a deep bay, with several small islands at its mouth. It possesses a fine port called Musal el Chak Chak, with a good and secure anchorage. Owen describes it as being one of the most fertile islands in the world, luxuriant vegetation springing spontaneously from the soil, and abounding in excellent ship-timber: it is situated about eighteen miles from the mainland, and twenty-five from Zanzibar. It yields rice of the finest quality, and carries on an extensive trade with the ports on the coast and Zanzibar. No soundings can be obtained between Pemba and the coast, nor between it and Zanzibar.

Lieutenant Smee thus describes the island of Zanzibar:—

Zanzibar.—Zanzibar, situated between the 6th and 7th degrees of south latitude, and 39th and 40th of east longitude, is an island of considerable extent, being nearly fifty miles in length and twenty in breadth. Its distance from the east coast of the African continent, along which it stretches in a north-easterly by a south-westerly direction, may be about fifteen or sixteen leagues. Between the continent and the island, however, there is no passage for large vessels except through the harbour, as a reef runs obliquely across from the African shore to the small islands which lie close to the western side of Zanzibar. These islets, which stand considerably nearer to the south than to the north extreme of the island, are all except one covered with

wood, and help to form the harbour. They run in a semicircle, the concave side of which is towards Zanzibar, and are connected together by reefs of rocks, which in rough weather break the swell, and render the port remarkably smooth and safe. The entrances into it are from the north and south; both lead between the small islets at the extremity of the semicircle and the western shore of Zanzibar: the northern entrance, which leads within the small woody isle called "Frenchman's Island," is very narrow and crooked, in consequence of sandbanks which run out from opposite shores crossing each other. On the shallowest part (which will be known by bringing the three northern woody isles in a line) the depth is not more than from three to four fathoms: the southern passes between a sandy isle* and the point on which the town of Zanzibar stands; it is broader than the other, and has seven or eight fathoms water in it. The depth within the harbour is from seven to nine fathoms, with a tolerably good bottom; the rise of water during springs is nearly three fathoms. Immediately adjoining the north-east of the town is an extensive creek or inlet, which runs a little way in, and turns up behind the town; here vessels of all descriptions are hauled up in security during the violence of the south-west monsoon. With a very little care it might be converted into an excellent dock, and deepened so as to admit with ease ships of at least 500 or 600 tons.

The appearance of the island is extremely delightful; it is in general low, especially at the extremities, where it is thickly covered with jungle and brushwood; but towards the middle the land rises into hills and gentle eminences, which are cultivated and clothed with cocoa-nut trees. Besides the periodical rains, which fall here from the month of March to September, the island itself is well watered with a variety of springs, which unite and form a number of delightful streams, which flow during the dry season and keep up that appearance of fertility and beauty which it exhibits throughout the whole year. None of these streams are large; that at which vessels water is situated about a mile and a half north of the town, where it flows into the sea at the northern entrance of the harbour: the water, when first taken up, is good, but from the quantity of putrid vegetable matter in suspension, upon keeping a short time it becomes very offensive; in a few weeks, however, the matter is precipitated, and it regains its original sweetness. Ships ought always to fill at low water, or the water will be brackish.

The climate of Zanzibar is similar to that of India, only the monsoon or rainy season commences earlier. From September to March the weather is dry and warm; the other months are rainy and tempestuous. The thermometer from February to April ranges from 80 to 90 degrees.

The town of Zanzibar is situated on the west side of the island, on a tongue of land formed by the above-mentioned creek, and faces the

* The only one of this group of islands that has no wood upon it.

small sandy island which constitutes the southern boundary of the harbour. It is large and populous, and is composed chiefly of cadjan huts, neatly constructed, with sloping roofs: there are, however, a good number of stone buildings belonging to the Arabs and merchants, and in the centre, close to the beach, stands a fort, apparently partly of Arab and partly of Portuguese construction. It is square, with a tower at each corner, and a battery or outwork towards the sea. The island possesses only one town; those living in the country, being principally the slaves of landholders, are scattered over their respective owner's estates. Lieut. Smee states, that he was told that the revenue at that time amounted to about 60,000 crowns annually, but that he had reason to believe that it was much more; it is derived from the customs and land tenures. The principal articles of export were slaves, ivory, and drugs, cocoa-nuts to Malabar, as also wax and tortoise-shell. The number of slaves then exported to India, Muscat, and the Isle of France, was estimated at 10,000 annually, but the Imaum of Muscat has now entirely abolished the traffic in slaves. The quantity of ivory exported is very great, and a rapidly-increasing trade in various other products of the island and adjacent coast has within a few years been established. The chief imports are Surat cloths, iron, sugar, and rice from Bombay; rice from the island of Pemba; dates from the Persian Gulf; ivory and drugs from Magadosho, Brava, and Mombas; and various other towns along the African coast. The value of the imports at the time of Lieutenant Smee's visit was valued at 30 lacs of rupees annually. A great quantity of timber is also exported to the Red Sea and Persian Gulf.

The inhabitants of Zanzibar consist of Arabs, principally from Muscat and the Persian Gulf, the descendants of Arabs by Sowahili mothers, and the Sowahilis. The Arabs, though not numerous, are the owners of most of the slaves and landed property. The number of inhabitants Lieut. Smee estimated at 200,000, three-fourths of whom are slaves.

The slave trade at Zanzibar appears to have been conducted with a greater degree of barbarity and cruelty than in most other places; but as it happily no longer exists, (at least openly,) Lieutenant Smee's description of it may be passed over.

In comparing the Somaulis and Sowahilis, he states, "The Somauli has neither the thick lips nor flat nose which distinguish the negro, and which are very prominent features of the Sowahilis of Zanzibar. The Somaulis are also to be distinguished by their slender make, which renders them more active; and they possess a superior degree of vivacity to the others, who appear to be of a grave, dull character." With regard to the religion and peculiar customs of the Sowahilis, those at Zanzibar being under the sway of Arabs, in general adopt their manners; and those who profess any religion follow that of their masters likewise.

Previous to the visit of Lieutenant Smee in 1811, only one English

ship had been there for thirteen years, although the French had long established a trade there for slaves and Mocha coffee.

The soil of the island is in general light and sandy towards the shore, but a little inland it is found to be a rich black mould, apparently formed of decayed vegetation, and the numerous springs and periodical rains, with the excellent shelter afforded by the cocoa-nut trees which everywhere cover the island, all conspire to render it extremely fruitful. Nothing can exceed the profusion of fruits abounding in every quarter, all of them excellent: pine-apples of the most delicious flavour grow everywhere wild; and heaps of oranges and guavas, for want of consumers, are left to rot on the ground. The sugar-cane grows in great plenty, but the inhabitants are ignorant of the art of making sugar.* The principal fruits and vegetable productions of the island are—pine-apples, guavas, mangoes, lemons, limes, oranges, plantains pumpkins, onions, cocoa-nuts, sweet potatoes, and the root of a plant called by the natives mahogo, (the *ferina de pao* of the Portuguese;) no grain is cultivated, perhaps from the abundance of fruits superseding the necessity, and rendering them averse to undergo the labour of tilling the ground.

The mahogo, which is the principal article of diet, is eaten either roasted or boiled; or it is cut into small pieces, which being dried in the sun, is ground into flour, of which they make a very palatable kind of bread. The only operation of agriculture consists in clearing the ground, which is done by fire, and is the general practice throughout Africa. Within the tropics, where the luxuriance of vegetation is so great, it would be a work of great labour, if not of absolute impossibility, to get rid of this in any other way: the time of burning it is at the end of the dry season, when the crops are collected, and the rainy season about to commence.

Asses and camels are the only beasts of burden, and, being scarce, are very valuable; a few horses have been imported by the Arabs; bullocks and goats are good and plentiful, the other quadrupeds are cats and monkeys of various species. There are scarcely any dogs on the island, the Sowahilis and Somaulis having a great aversion to them; and when a dog accidentally touches one of them, he manifests great abhorrence and disgust; poultry is plentiful and cheap, and Guinea fowl are found in great plenty wild on the island. Rice and ghee are procurable in considerable quantities, but are expensive. Among the shoals and rocks which connect the small islands that surround the harbour, and in the harbour itself, delicious fish of great variety are easily taken in plenty, either with nets or hook and line; the shoals also abound in a variety of curious and beautiful shells.

English and American merchants are now discovering the importance of the island of Zanzibar as a place of commerce, which is rapidly increasing and becoming a depôt for the trade of the whole adjacent con-

* Good sugar is now made in great abundance at Zanzibar, and sold at a very low price.

tinent; and the baneful slave-trade having been abolished, the vast resources and valuable productions of the surrounding country will doubtless be more fully developed; and we may hope to see the cities of Malinda and Mombas gradually recover from the decay caused by the withering oppression of the Portuguese, and regain the high degree of opulence and civilisation they enjoyed at the commencement of the sixteenth century. Owen remarks, "Experience has shown how fatal the climate of Zanzibar is to Europeans." That such was the case some years ago is very probable, from the filthy state of the native town, and the custom the Sowahilis had all over the town of burying their dead amongst the houses, and covering the bodies with so slight a layer of sand, that they were frequently exposed to public view, and often leaving the bodies of slaves to putrefy unburied on the beach, in consequence of which disgusting practice the stench in and around the town was intolerable, and tended to produce sickness, fevers, &c.; but it does not appear that Zanzibar is now an unhealthy island—indeed, it is stated by Europeans who have resided there to be very healthy. Fevers of the intermittent form are prevalent during the rains, but not severe.

Owen also says, "In no place were we furnished with refreshments so cheap, and of such excellent quality, as at Zanzibar; our decks every morning exhibited the appearance of a market, where for a dollar upwards of two dozen of fowls could be procured; sugar, of an excellent quality, at twopence per pound; very superior rice at a penny, and a great variety of fruits in proportion; bullocks, of the humped breed, of a moderate size, were obtained at five dollars a head; and sheep of the Tartar kind very cheap."

Rivers.—But the principal object of interest on the eastern coast of Africa has always been the supposed existence of a large river flowing through the interior, and disemboguing on the eastern coast; its discovery was one of the principal objects of Lieutenant Smee's expedition in 1811, and we are still as far from a satisfactory knowledge of it as at that period. Fresh interest has lately been excited with regard to it by the information obtained by Captain Harris from slave merchants at Ankobar, who declare that a river of immense extent flows to the south, below the equator. An account greatly confirmative of the truth of this information was obtained some years ago by the resident at Muscat, from some people of respectability at that place, who were well acquainted with the part of the African coast in question, and stated that a river of immense extent, known to the natives in its neighbourhood by the name of Neelo, (Nile,) and supposed by them to have its source in common with the Egyptian river of that name, discharges itself into the Indian Ocean in about 0 deg. 5 min. north latitude; near to its mouth it is called Govinda Khala: that the length of its course is about three months' journey: that two weeks' journey from the mouth stands a large city named Gunamma, up to which the river being navigable, immense numbers of slaves, elephants' teeth, &c., are brought down within a short distance of Brava, to which (the river

then taking a more southerly direction) these articles of merchandise are afterwards carried overland, and either disposed of there or sent to Zanzibar.

The river here alluded to is known to us by the various names of Juba river, Rogues river, and river Govinda, and was known to the Portuguese by the name of Dos Fuegos; but no attempt has been made to sail up it, and its course through Africa is totally unknown to us. When at Patta, the Sultan informed Lieutenant Smee that the river Govinda is of immense extent, that its sources were far beyond his knowledge—commonly believed to be in his (Lieutenant Smee's) country, that a great number of slaves were brought down it to Brava, but that he was totally ignorant of the towns, state of the country, or people who dwelt on its banks. It is remarkable also, that a statement similar to that made to Captain Harris, regarding the existence of a race of pigmies in Central Africa, is told with many protestations of veracity by the Meric Mongoans, who occupy the country inland from Mombas, and who are in the habit of visiting, with the products of the interior, the latter place: they say that these pigmies are called Berikimo, that they scarcely attain the height of three feet, and that the country they inhabit is at a distance of six weeks' journey from Mombas.

To the north of river Govinda are two rivers—the Deera, and river Webbe,—neither of which have been explored, and nothing but the fact of their existence is known to us regarding them.

The Deera is very large at its mouth, and is supposed to take its rise in the Chakka mountains, which border Abyssinia on the south.

In the Bay of Formosa the river Quilimanci or Ozy discharges itself; it is one mile across at the entrance, and there is a dangerous quicksand bar, over which, at low-water, there is only four feet of water; farther in it is stated to be much larger, and of great extent. During the rainy season the river rises and inundates the surrounding country. To the north of this, near the island of Patta, is Grand River, which has never been explored, but is supposed to be a branch of the Quilimanci, these two uniting and forming a noble large river, a short distance from the coast. These rivers united are probably the river "Gochol," described, as above mentioned, by Captain Harris, from native information; the Quilimanci or southern branch disemboguing in 2 deg. 45 min. south latitude. To the south of this is the river Quiliffa or Killefy, situated in lat. 3 deg. 36 min. south, long. 39 deg. 26 min. east. There formerly existed a large town at its mouth, which was attacked and destroyed by the Gallas. A short distance below it is another river, called by the natives Channey; these probably unite at some distance from the coast, or are branches of the Quilimanci. Farther to the south several large rivers are known to exist, the principal of which are the river Foonganey or Pangany, situated between Zanzibar and Pemba; the river Cuavo or Rovooma, situated in about 9 deg. 20 min. south lat., which empties itself by two mouths, and is

one of the largest rivers on the east coast; its course and source are quite unknown to us: the Zambesi, which is supposed to surpass all the other rivers in magnitude and extent;—it discharges itself by several channels which bear different names, the principal of which are the Luabo, or Suabo, and the Quilimanci. A short distance to the south of these are the Zimbaoe or Boozy river, which disembogues near the ancient town of Sofala, which is supposed by many to be the Ophir of Scripture, and the river Sabia, which is said to be a branch of the great river Zambesi; it is a large river in the interior, but narrow at its mouth. The river Inhambané, to the south of these, is only navigable for ships a few miles from its mouth.

The river Lindy discharges itself into a bay, in which the water is very deep; the entrance to the river is eight miles across, and the depth of water inside considerable, but, like most African rivers, a bar at the entrance, over which the depth does not exceed three fathoms at low-water, presents great obstacles to navigation. A few miles from the sea the river branches off into several small streams, forming a number of low islands.

To the north of Cape Guardafui the whole country, as above stated, is inhabited by various tribes of Soomallies, as far as Zeila and the neighbourhood of the river Hawash; the tribes adjoining them on the north are called Dankalli (plural Danakil) by the Arabs, Adel by the Abyssinians—which name is also generally applied to them and the country they inhabit, in European maps, but they call themselves Affer. They occupy all the coast up the Red Sea as far as Arkeeko; they consist of various independent tribes, who frequently have bloody battles with each other: the principal tribe is the Ad-Alli, who occupy the southern part, and from them the name "Adel" is probably derived. The Shoho are the principal northern tribes; they have all one common language. Those, however, towards the north, speak the Tigri. They are a savage wandering race, generally of a jet black colour, with sharp features, and wear a large bushy head of hair. Their dress generally consists of a piece of coloured Surat cotton tied round the waist. They are bigoted Mohammedans; very treacherous and cruel in disposition. Those who reside on the coast carry on a considerable trade,—their boats visiting Zanzibar, Berberra, and the ports on the eastern coast; the chief town they occupy is Houssa, situated some distance inland, near the river Hawash; they are also the principal slave-dealers on that coast, purchasing them from the Abyssinians and selling them at Tajurra, Zeila, and Berberra. The women are chiefly employed in making mats of the leaves of the Doom palm, which are used for covering their huts and other purposes, as amongst the Somaulie tribes. A great quantity of ivory and hippopotamus' teeth are procurable in several parts of their country, especially the valley of the Hawash: the latter article is now likely to become a considerable article of trade, as they are more valuable for some purposes

than elephants' ivory, being of a finer grain. Until lately the natives never collected the teeth, killing the hippopotamus only for the sake of the skin, of which they make shields, &c.

Their language is much mixed with Amharic and Arabic. The peculiar antipathy which they manifest to the flesh of the common fowl has been considered strongly indicative of their Egyptian origin, and several circumstances connected with the tract they occupy tend to a belief that they are not the original inhabitants of that coast, or have been much mixed with Arab and other races. Their country yields myrrh, senna, gum-arabic, and various other productions.

Hurrur.—The kingdom of Hurrur, situated some distance inland between the Dankalli country and the southern boundary of Abyssinia, from its importance and wealth, deserves some notice; but as no European has hitherto succeeded in visiting it, being deterred by the savage and jealous character of the Sultan, very little respecting it is known to us. Its capital, bearing the same name, is reported to be a large flourishing place, defended by a square fort, and the river Sambi runs close to the town; but its farther course has not been traced. Hurrur is the seat of an extensive trade in coffee, (which is much superior to that of Mocha, and always fetches a higher price—it differs from that of Arabia in being of a large flat berry,) gums, myrrh, frankincense, senna, slaves, ivory, &c. It is visited by caravans from Abyssinia, Gurague, Berberra, Tajurra, Zeila, and other places; and is much frequented by Arab merchants from the Red Sea. The soil is reported to be extremely fertile, and the climate mild; but whilst governed by such a bigoted, barbarous chief, no commercial advantages can be expected from it.

The language of Hurrur is stated to be different from any other known; a few manuscripts written in it have been procured by a French traveller, but although I made repeated inquiries at Aden, I was unable to procure any specimen of it. The Mohammedan merchants who visit Hurrur do not complain of any ill-treatment; but Christians, and especially Europeans, are most rigorously excluded. The river Hawash, which borders Shoa on the south, is said to have its source in the mountains of Chakka, as also the river Anago, which is to the northward, and is called Yasso in the lower part of its course. Both rivers are supposed to be absorbed by the sands before reaching the sea, but very little is known respecting either river. The wide valley of the Hawash is very fertile, possessing magnificent forests, abounding in elephants and wild beasts. The Galla tribes, however, who occupy the neighbouring country and the Adel, are barbarous savages,—regarding every stranger as an enemy.

Besides the Abyssinians, who, in the modern kingdom of Shoa and the great province of Amhara, speak the Amharic language, those of the northern part and the province of Tigri speaking a different dialect of it, which is called the Tigri language. Various independent tribes are scattered over this fertile and inviting country. Of these, the

Jewish race, which has been settled in Abyssinia from time immemorial, cannot fail to be the most interesting to Europeans. They are termed by the other inhabitants of the country, whether Christians or Mohammedans, Felassjan, or Falasyan, which signifies "the exiled." They are most numerous in Tigri and Amhara. These Jews, up to the year 1800 A.D., were governed by kings of their own persuasion, who resided, from more than a century before the Christian era until the year 1542, in a city built on a rock, situated in the northern part of the mountainous country of Samen, and called Ambahi. Subsequent to that period, however, the seat of the Jewish court was moved to Foloen, to Sagareteh, and afterwards to Missurat. They not only defended themselves successfully against the Christian princes of Abyssinia, but in the year 960 we find that, supported by their king and his daughter Judeth, they attempted to subvert the Christian religion and the destruction of the royal race, stated, according to the chronicles and traditions of the country, to be directly descended from Solomon by the famous Queen of Sheba or Saba, called Belkis by the Arabs, and, according to their account, married to Solomon. The Jews massacred the whole of the Egyptian royal family, with the exception of an infant who was providentially preserved; and three hundred years subsequent to this occurrence, the crown was transferred to the posterity of this prince by the famous monk Teila Haimanot, who founded the monastery of Seebra Lebanos, which is still existing in the neighbourhood of Tigulet, the ancient capital of Abyssinia, and whose memory is still greatly revered by the Abyssinians, they observing three festivals annually in commemoration of his birth, death, and ascension into heaven. The crown has ever since continued in the family of this prince, whose authority is, however, at present merely nominal, it being usurped by the minister, as was the case with the Peishwas of the Deccan. When Bruce visited Abyssinia, the Jews could bring 50,000 men into the field. On their royal family, about the year 1800, becoming extinct, they acknowledged the Christian king of Abyssinia as their sovereign.

To ascertain at this distant period the probable time when the Jews first emigrated to Abyssinia, is probably impossible. The Abyssinians have a tradition that they were converted to the Jewish faith after the Queen of Saba's visit to Solomon; but as the Jews of Samen have, up to the present time, remained a perfectly distinct people, retaining their own laws, language, and institutions, termed the "exiled" by the other inhabitants of the country, it is evident they form no part of the original Abyssinian race who were converted to Christianity in the third century of our era by some Greek priests who were accidentally wrecked on the coast when on their voyage to India, having been sent by St Athanasius from Alexandria.

Whatever degree of truth may be ascribed to the Abyssinian tradition of the Queen of Saba, it is certain that three centuries before the Christian era the Jews possessed great power in that country, and had

widely extended their religion amongst the pagan inhabitants of Abyssinia and the countries bordering on the Nile.

Agatharcides relates that "most of the Troglodytes are circumcised partially like the Egyptians; the people called Colobes (mutilated) by the Greeks, circumcise their children, as soon as they are born, entirely." In Abyssinia many Christians circumcise their children the eighth day after they are born—this custom has doubtless arisen from the ascendancy the Jewish customs had attained over the Abyssinians previous to their conversion. The peculiar mode of circumcision practised by the Abyssinian Jews corresponds also with the directions of the Pentateuch, but differs from that practised by Mohammedans.

Artemidorus also states that the Colobes circumcised their female children in the same manner as the Jews. This custom is even at the present date preserved by the Abyssinians, although being prohibited in the Talmud. It is not practised by the Jews of any other country.

When the Portuguese, in the beginning of the seventeenth century, converted the Abyssinians from the Greek to the Catholic Church, they insisted on these peculiar rites of circumcision being discontinued; but the people were so wedded to their ancient custom that they found it impossible to wean them from it. It may be remarked, that a similar custom of female circumcision is practised by the Somauli tribes.

The Abyssinians also, of whatever religion, abstain from the meats prohibited by the Mosaic law, and observe the Jewish Sabbaths—these particulars affording strong evidence of the ascendancy the Jews had attained in that country at a very early period.

Diodorus Siculus* also says that near the southern extremity of Bab-el-Mandeb, there dwelt a race of Troglodytes, who believed that the bed of the Red Sea had been twice exposed dry for twenty-four hours. This tradition must have been derived from the Jews, as it is not to be found amongst any other people of antiquity.

According to Philostorgius, the southern coast of Abyssinia was peopled by a colony of Syro-Jews, transported there by Alexander, and that in the fourth century they spoke the Syrian language; that in the course of time they spread over the interior, and that on the route the Jews took in going from the Holy Land to Abyssinia were many Jewish States, up to the middle of the sixth century.

The great degree of reverence in which the Abyssinians have always held Jerusalem and the Holy Land, is a further proof of their Jewish connexion. Brought up from their infancy to reverence it in an equal degree as the Mohammedans do the Kaaba of Mecca, they formerly made frequent pilgrimages to it, although of late years, from the distracted state of the country, and the difficulties thrown in their way by the Mohammedan rulers of Egypt and Syria, the number of those who visit the Holy Land has very greatly diminished.

The term "gyz," the name given by the Abyssinians to both their country and written language, and which signifies "colony or emi-

* Lib. 3, c. 122.

gration," was doubtless first applied to the colony of Syrians or Syro-Jews, and spread with them over the country, and was eventually applied to the language, from the Jews having introduced the learning and sciences of Europe. It is a matter of surprise that so numerous and interesting a people as the Jews of Abyssinia have excited so little attention in modern times; and that, although the zeal of missionaries has carried them into the most barbarous countries, so little information has been acquired regarding the condition of the Abyssinian Jews.

Ludolphe is of opinion that the Abyssinians were a colony of Arabs, who peopled the country at a very remote period, anterior by some centuries to the Christian era. The term "gyz," which the Abyssinians apply to themselves, would favour this supposition; but it is not supported by their customs, manners, physiognomy, or history.

Neither do the Arabs claim for their country the peopling of Abyssinia, nor do the Abyssinians believe themselves to be descended from the Arabs; although it is well known that numerous Arab colonies have at various times emigrated to the Abyssinian coast, where to this day numerous Arab tribes are found quite distinct from the other inhabitants, preserving, and in some cases sedulously cultivating, their own language, and leading the nomadic life so characteristic of their original country. We have accounts of two of these emigrations: the first, which occurred in the fifth year of Mohammed's mission, when sixteen persons of the Koreish tribe fled into Abyssinia, and these were afterwards followed by others, to the number of eighty-three men, eighteen women, besides children. The refugees were kindly received by the Nagashi or king of Ethiopia,* and he refused to give them up.† It is a singular circumstance, as distinguishing the Abyssinians from all other African nations, that although all the surrounding nations were quickly compelled to embrace the doctrine of Mohammed, which spread with rapidity over great part of the African continent, from the shores of the Red Sea and Mediterranean almost to the South Atlantic, and the Christian kings of Ethiopia and Yemen had become converts to his faith, no impression was ever made on the Christians of Abyssinia, who remained firm in their own religion, and at a later period successfully resisted every attempt to convert them to the Roman Church, although the Portuguese priests were for a time successful, and had converted the king to their doctrines. Although the modern Abyssinians have much retrograded, and the ancient prosperity and learning of the country declined, yet, being the earliest African nation that embraced the Christian religion, they have a peculiar claim to our notice. The present state of ignorance and superstition, unfortunately so prevalent in that fine country, arises principally from its isolated position, by which for several centuries they have been excluded from all intercourse with the civilised world; and surrounded as they are by bigoted and barbarous nations, it naturally follows that learning, arts, and commerce have gradually declined.

* Properly Nagús ንጉሥ Amh. † Sale's Preliminary Discourse.

Many circumstances might be mentioned to prove that these were very flourishing in Abyssinia at a former period. The Ethiopic language, in beauty, copiousness, and the number of books that have been written in it, equals the Arabic: the magnificent ruins at present existing in various parts of the country prove its former flourishing state. According to the Abyssinian traditions, the city of Axum, the splendid and extensive ruins of which now exist, was built by the Cushites in the time of Abraham. As late as a century before the time of Mohammed, the Abyssinians having crossed over to Arabia Felix to assist the Christians of that country against the persecutions of the Jews, were so powerful that they not only drove the Jewish king, Dhu Nowas, from the throne, but four Abyssinian princes governed the country successively until Khusru Anushirwan, king of Persia, having sent succours to the prince of the tribe of Hamyar, drove out the Abyssinians, but was himself slain by some of them who were left behind.* The Abyssinians had at a very early period established a communication with India, and even possessed a colony in the Concan; they were also employed as officers of the fleet under the Hindoo princes of the Deccan, and held the fortified island of Jingeera: they are also said to have erected the fort of Chakun, near Poonah, but the precise time of the commencement of their power in this quarter, and its extent, is not exactly known,† but is probably of a very remote period.

Notwithstanding the present rude and unsettled state of the country, it is but justice to the national character to state, that the person of a traveller is generally respected in Abyssinia; instances to the contrary are rare, and on any sudden outbreak occurring, there are several cities and places of refuge, as was the custom among the Jews, in which a person is quite safe: of these are Waldebba in Samen, Taras, Sabar Avagara, the abode of the Itchegwa or Prior of the monks at Gondar, and Cuwaral on the banks of the Lake Dembea. The numerous churches, monasteries, and several mountains, are also places of refuge.

The Amharic language, which is spoken over the principal part of Abyssinia, is derived from the Ethiopic, in which character it is now written, although in former times it was not a written language; it has now quite superseded the Ethiopic; it contains many Arabic and Greek words; the character is written from left to right; it consists of thirty-three simple letters, the forms of which are multiplied six times, by each vowel being blended with, and altering the form of, the primitive; there are also several compound letters, and the figures differ from all those of Europe or Asia, and are singular, as the number of figures

* In some remarks prefaced to an "Outline of the Somauli Language," I have stated an opinion that the Somaulies are the descendants of this remnant of the Abyssinian invaders of Arabia. Their customs and features are very similar to those of the Abyssinians; and they say their ancestors fled from the opposite coast, and took possession of the country they now occupy.

† Grant Duff's History of the Mahrattas.

does not increase in the same ratio as the magnitude of the number to be expressed; thus it requires four figures to express the number 375, (ГРСЗ) and only two figures to express 5000 (ሃየ፡).

It is difficult to determine the origin of the Ethiopic letters, they discover few affinities with other known alphabets; the በ bet resembles the Hebrew ב beth, but is differently placed, the gemł ገ resembles the deva-nagara ग g; the lawi ለ and ተ taur resemble the Greek Λ and T; the ቀ kaf also bears some resemblance to the deva-nagari ቀ k.

The Himyaritic character, called by the Arabs Al Mosnad, has been supposed to be the same as the ancient Ethiopic: it was used first exclusively by the tribe of Hamyar, which gave a long line of kings to Arabia Felix; it was neither publicly taught nor suffered to be used without permission first obtained;* it was in use amongst the Hamyar Arabs at the time the Cufic was the general character of the other Arab tribes, but we have no proof that it was in use previous to the invasion of the Ethiopians about a century before the time of Mahommed. The knowledge and use of it being limited first to the Hamyar tribe, who were first Jews and afterwards Christians, and subsequently extended only to the Christian tribes of Arabia Felix, favours the supposition that this character was introduced by the Ethiopians or Abyssinians; the fact also of so many ancient monuments and inscriptions existing in Yemen and Aadramaut engraved in this character, is accounted for by the Hamyar having been the ruling tribe of the country, and their seat of government fixed at Dharfar, one of the finest cities of Arabia, situated near the modern Sennaa, the capital of Yemen.

The Shangallas or Shankallas are the ancient Cushites and Troglodytes; they inhabit a low flat country to the north of Abyssinia, between the river Tecassi, the ancient Astaboras, and the river Mareb; they are black negroes, in the most primitive state of barbarism; the Abyssinians hunt them like wild beasts, selling those they capture as slaves, but inhabiting as they do the low marshes and impenetrable forests, they dwell in comparative security, and multiply with great rapidity. From the description given by Captain Harris of the Doko, a set of barbarians living to the south of the line, they appear greatly to resemble the Shankallas, who, like them, live on insects and reptiles, and live in caves, and arbours formed of the boughs of trees.

The Agows, of which there are two distinct races, inhabit the country bordering on the lower part of the Tecassi, and the fertile country of Temben; they have a distinct language of their own, are a quiet pastoral people, generally selecting the banks of rivers for their residence. Most of them profess the Christian religion.

The Teltels, a branch of the Affer or Adel tribes, occupy a narrow tract of land bordering on the Red Sea and the great Salt Plain; some of them were converted to Christianity by Sebagadis, the Ras of

* Sale's Preliminary Discourse.

Tigri; they are a treacherous, cunning race, rendering it very unsafe for any traveller to venture among them.

A singular class of people exists in the province of Wojjerat, who pride themselves on being the descendants of the Portuguese soldiers who settled in the country in the seventh century. Pearse describes them as being taller and stouter than the generality of Abyssinians, and hospitable and kind to travellers. To the south of them is an insulated tribe of negroes called Doba; their country has not, however, been explored.

The Hazorta tribe, also a branch of the Affer or Adel nation, occupy a tract along the shore of the Red Sea to the south of Arkeeko; they are a wild roving people, much given to plundering, and few travellers have ventured amongst them.

Of the various tribes of Arabs who have at different times located themselves in the fertile valleys watered by the Nile and its numerous branches, the Berbers, the Sheygya, the Ababde and Bisharye are the principal. The Berbers are described as being very numerous, and lead a pastoral life; their country is just below the two great branches of the Nile. The Sheygya dwell more to the north, and form the most powerful state in Sennaar: they are described by Burckhardt as a perfectly independent people, possessing great wealth in corn and cattle, like the Bedouins of their original country: they pay no tribute to their chiefs; they are very hospitable, and hold sacred the person of their guest. Their language is exclusively Arabic, and they have schools in which are taught all the sciences which form the course of Mohammedan study. The Ababde and Bisharye are a savage treacherous race: they still retain their Bedouin habits, wandering about with their cattle, by which they principally live. Various other Arab tribes are scattered along the shores of the Red Sea, and towards the Nubian desert, but nothing interesting regarding them is known: they in general live quite distinct from the settled inhabitants of the country.

Hindoo Knowledge of N. Africa.—According to the Puranas, the knowledge the Hindoos formerly possessed of the north-east parts of Africa, and the countries bordering on the Nile, was very considerable. The Shankallas or ancient Cushites bear, to this day, the name applied to them in the Puranas, and which is a word of Sanscrit derivation, from shanka a shell, because its inhabitants (the Troglodytes of the Greeks) lived in shells, or caverns hollowed out like shells. The Sancha-divissa of the Puranas is the Troglodytica of the ancients, and included the whole western shore of the Red Sea as far as the Straits of Bab-el-Mandeb.

The Berbera-desa of the Puranas is the same with the Berber of the present day, which includes all the land between Syene and the confluence of the Nile with the Tecasse, which is the Asthimati or lesser Chrishna of the Puranas,* and the Sanchanaga or Mareb.

Various emigrations have, according to the Puranas, taken place at

* Wilford's Essay, vol. iii., Asiatic Researches.

different times from India to Cusha-divissa, the land of the Cushites or Abyssinia. Supposing these accounts to be founded on truth, it may account for a great portion of the African continent being formerly called India by the Greeks. Even in the time of Marco Polo, Abyssinia was called Middle India. It is remarkable, as Mr Bruce and Bryant have proved, that the Greeks gave the appellation of Indians to the southern nations of Africa; and Strabo relates that they called all the southern nations in the world Ethiopian, thus using Indian and Ethiopian as convertible terms.

It also appears from the Puranas, that the Sanchayanas or old Shangallas were not so entirely destitute of knowledge and science as at present, and the Brahmins admit that they possessed a part of the Vedas.* Bruce describes the arbours inhabited by the Shangallas, in the depths of the Abyssinian forests, in a manner quite conformable to the description given of them in the Puranas. The Greeks also represent one of the two Cupids as living on the sea-coast occupied by the Troglodytes or Shangallas.

The origin of the Gypsies of Europe has been ascribed with different degrees of probability, by various persons, to Egypt, India, and the western coast of the Red Sea; but it appears to have been overlooked that the Amharic name for Egypt is still Giptz, and for the natives of that country Giptzi. The same people (the Gypsies) are called Zingaros or Zinganos by the Italians. The Persians apply the term "Zangi" to all the natives of the north-east portion of Africa, including the Abyssinians; thus, it is not improbable that these people emigrated from the Abyssinian coast—acquired the name Gypsey or Giptzi from having entered Europe through Egypt; and that they were called Zinganos by the Italians and people of the adjacent countries, from the Turkish and Persian name "Zangi," an Ethiopian, or inhabitant of north-eastern Africa. It is remarkable, that in a map of the north of Africa compiled by Wilford, upon the authority of the Puranas, a lake called Amara, or the Lake of the Gods, is placed on the eastern side, and between the 5th and 10th degrees of south latitude. From this lake they imagined the Nile to take its rise; and, passing Sancha-divissa and Berbera-desa, it receives the Nile of Abyssinia (the Bahrel-Azrek or Blue Nile,) the Asthimati or Tecasse, and the Sanchanaga or Mareb. This lake of the gods is believed to be a vast reservoir, which supplies all the rivers of the country. Bruce, from native information, places a large lake at the source of the Bahrel-Abaid or white Nile. It is remarkable that the question, whether such a lake does in reality exist, has not to this day been satisfactorily determined.

A singular account is given in the Puranas, respecting the range of mountains called "Hubab," situated in the north of Abyssinia. The word "Hubab" signifies a serpent or snake in the Amharic language, (ኡባብ:)—and the Puranas relate a wild legend, that these moun-

* Wilford.

tains were inhabited by the snake Sancha-naga; the principal river of that province was also called Sancha-naga—the modern Mareb, and the royal snake resided in its capital on the sea-shore. In the Dherm Shastre, the Nagas (Snakes) and Garudas (Eagles) are named as races of men descended from A'tri. The king of serpents reigned in Chasragiri, a mountain to the eastward, but his subjects were obliged by Garuda to supply him with a snake each day. Their king at length refused to give the daily provisions, and intercepted it himself. This enraged Garuda, who threatened to devour the snakes and their king: through fear of him they therefore retired to Sancha-divissa, where they settled between the Cali (Nile) and the sea: the royal serpent is called Sancha-mucha, because his mouth was like that of a shell, and the same denomination is given to the rocks on which he dwelt. The mountains of snakes are to this day called Habab. The breath of the Sancha-naga is believed by the Hindoos to be a fiery poisonous wind, and by this hypothesis they account for the simoom or pestilential wind, which blows from the mountains of Habab, through the whole extent of the Nubian desert. It is probable that this tradition has also some connexion with the Heredi, so famous throughout Egypt. Wild and extravagant as the legends of the Paranas are, there is no doubt, from a similarity of names, and the correct situation given to the Nile and other rivers of Abyssinia, that the Hindoos formerly possessed very considerable knowledge of the countries bordering on the Nile; and from the terms "Indian" and "Ethiopian" having been formerly used as convertible terms, it is probable that considerable intercourse had existed between the two countries from the earliest period. We cannot but lament that a vast country like Abyssinia, of which such undeniable proofs of ancient prosperity and greatness are adducible, should be now at so low an ebb, and that our knowledge respecting it is still so very deficient. Possessed of vast natural resources, fertile, with a delightful and bracing climate, an active, hardy population, under a settled government it might again become the most important kingdom of Africa. Even until within the last few years, the trade between Mussowa and the ports of Cutch was very considerable. The French having recently appointed a Consul-General to Mussowa, appear quite aware of its commercial importance; and whilst civilisation is making rapid strides in most other countries of the globe, it is to be hoped that Abyssinia will not escape the attention her situation, natural resources, and Christian population merit from the politician and the philanthropist.

C. P. RIGBY.

March 24, 1843.

SPECIMEN OF THE LANGUAGES SPOKEN ON THE NORTH-EAST COAST OF AFRICA.

English.	Sowahili.	Somauli.	Galla.
God	Mooangur	Giboo	Waag
The Sun	Toow,ar	Gib,e	Hathoo
Wind	Palpo	Oonoofar	Affoan
Rain	Foo,ar	Roo	Buk-raina
Earth	Meetee	Dool	Suff
A Hill	Jebalee (Arb.)	Jebal (Arb.)	Degacha
Iron	Tchoomar	Bir	Levilla
Gold	Daaboo (Arb.)	Diyib	Deema
Silver	Faida (do.)	Cullan	Cullan
Fire	Moto	Dub	Eewada
Water	Mety	Gar	Moo-acoo
A River	Matony	Wahwee	Do-ab
A Well	Rissee,ma (Arb.)	Hail	Alema
A Fish	Summakee (do.)	Matalie	Hoortoomo
A Horse	Farassay	Farassay	Furda
A Camel	Gameea	Galee	Galolai
A Cow	Gnombai	Loyah	Lawoom
A Sheep	Cundow	Heerre	Reeai
A Lion	Dembar	Looar	Maingai
A Dog	M'booar	Hai	Lurruttai
A Man	Mortoo	Dudd	Ittmee, num
A Son	Keyah, nar	Due,e	Hagobai
A Brother	Doogoo	Alookai	Ab,boo-laisee
A Father	Baba	Horakai	Abba-kee-a
A Mother	Mahmah	Hahie	Hadda-tuah
A Friend	Kuffueka	Weethai	Jia-bee-kiea
The Head	Ketwan	Matha	Muttai
A Boat	Batilla	Donie	Howooloo
To give	Neeppai	Shain	Anna Kennee
To buy	Moonoo, ah	Geth	Beetee
To sell	Kooza	Eeyeth	Anna Beetee
Salutation on meeting	Tambo or Yambo	Ha, heitah	Hofo
Answer	Jambo Yambo, Salmeen	Mia-hah	Muggeen
Good morning	Jumka	Burreetha	
Reply	Murhubba (Ans.)	Bursumma	
Hand	Keejanja	Gunna	Hurkee
Blood	Daamoo	Deek	Deek
A year	Marko	Saunato	Gunna
To kill	Coopujah	Do,e	Do,kee
To steal	Weefee	Keedowlai	Haltoo
To fight	Peeganah	Esdoe	Wullodanah
To die	Koofa	Oomatkee	Dooree
To hear	Selkia	Muggul	Daigaifadoo
One	Mowya	Ko	Taka
Two	Beetee	Lumma	Lumma
Three	Patoo	Seedee	Sahdee
Four	Hinna	Huffur	Hafoora

English.	Sowahili.	Somauli.	Galla.
Five	Tanoo	Shen	Shennoo
Six	Seeta	See	Tah
Seven	Sabba (Arb.)	Toda-ah	Pudba
Eight	Na-any	See-ed	Suddud
Nine	Paindar	Seegail	Seegalee
Ten	Roomee	Tomoon	Koodeen.

SPECIMEN OF THE LANGUAGES SPOKEN ON THE WESTERN SHORE OF THE RED SEA AND GULF OF ADEN.

English.	Dankalli.	Somauli	Amharic.	Galla.
God	Allah, yilleh	Allah	Ig zi abher	Waka
The Sun	Airo	Shums (Arb.)	Sehai	
Wind	Haha, hahaito	Dub,eel	Nafus	
Rain	Rob	Rob	Zenam	
A Hill	Koma	Bor, plur. boro	Terara	Degacha
Gold	Dahab (Arb.)	Dahab	Werke	Worke
Silver	La'ko	Lagh	Bir	Meti
Fire	Girra	Dup, dub	Isat	Gewada
A Cat	Dimbito	Dummud	Demet	
Water	Le	Beh	Waha	Bisan
A Well		Hel	Gwedgwed	Burka
A Camel	Gala	Awur	Gamela	Galolai
A Cow	Sagga, pl. lah.	Saah, or Loh	Lam	
A Sheep	Marru	Ari	Beg	
A Dog	Kut,ti	Ae	Wisha	Lurruttai
A Man	Nummu	Nin	Saw	Nama
A Woman	Barra	Nag	Set	Nitis
A Son	Ao,kah	Wil	Lidj	Ilma
A Brother	Tobokoita	Wilal	Wendem	
A Father	Abba, pl. Abboti	Abi	Aba	Aba
Mother	Ina, pl. inani	Hoya	Inat	Hada
The Head	Amoitah	Mudah	Ras	Mata
A Boat	Deuniki	Donah	Djulba	Howoolo
A House	Bura	Agul	Bet	Manna
A Day	Leo	Durar	Ken	Gafa
To-day	Assako	Manta	Zare	Anda
A Stone	Daga	Dugha	Dengya	Daga
Wood	Harda, harra		Inchet	Maka
Salt	Assebo	Usbooh	Tchow	
Milk	Hanna	Hanu	Wetut	
Language	Aff	Affkee	Aff: kwunkwa	

English.	Dankalli.	Somauli.	Amharic.	Galla.
Bread	Ga-ambo, gamboita	Kibis	Injira	
Salutation on Meeting	Mahisseni	Maberre-din		Naga Ambalte
Answer	Mahisse	Berre-na		Bulla bulte nagma
How do you do?	Manina teni?	Adeka wa siddi		Naga tshedde
Answer	Mu,i,to	Aneka wa sisun		Atis fei, uma
Good Night, Adieu	Nagasseni	Nubdee		Nagma, galgale sati
Answer	Nagasse	Wa nubdee		Nagai umbulla
To Buy	Kehena	Yibi	Geza	
A Night	Bara	Huben	Mata	
Bad	Me-muwe	Hun	Keffu	Hama
Good	Muwe	Nuksun	Melkam dug	Gari, guda
Hot	Dahana	Kul	Mukut	
Cold	Waha	Dahan	Berd	
Here	Akke	Hulka	Keziah	Baketancti
How much	Ma gede, ma kena	Inmissa	Sint	Maka
Now	Awi	Aminka	Ahun	Amma
To-morrow	Bera	Berri	Nege	Boru
Little	Ondukke	Yer	Tikit	Tenno
Yesterday	Kimal	Shullai	Tilant	Katisa
A Thief	Serk (Arb.)	Togh	Leba	
When	Ma waade	Hudmah	Metch	Iome
To die	Rabbih	Demi	Temote	Dooree
To hear	Abi, obi,i	Muggul	Tesemme	
1 One	Eneki	Mid	And	Tok
2 Two	Lame,i	Lubba	Hulet	Lama
3 Three	Siddehu	Sadah	Sost	Sadi
4 Four	Fere,i	Afarr	Arat	Afur
5 Five	Koono	Shun	Amist	Shani
6 Six	Lehe,i	Seh	Sedist	Tsha
7 Seven	Melhein	Tudobah	Sebat	Torba
8 Eight	Bah hara	Sideed	Semint	Sadeti
9 Nine	Sagalla	Sagall	Zeteny	Sagall
10 Ten	Tabbana	Tobun	Asra	Kudana
One Hundred	Bol	Bughul	Metto	Dibba
Black	Data	Muddo	Tekwer	
To sell	Elemi	Yibbi	Teshateh	
Money	Lako	Lagh	Bir	
The eye	Enti	Il	Eyn	
A Knife	Gille bara	Mindi	Kara	
A Name	Maggaa	Mugga	Sim	
Food	Nakame	Huroor	Ihil missa	
A Foot	Minto	Adin	Iger	
Spear	Maharu	Wurn	Tor	
Meat, flesh	Hado	Helib	Siga	
To milk	Digile	Lis		
Fear	Messite	Bug	Firat	
A Town	Magala	Maghala	Ketema	
A Fowl	Durhi	Dorah	Doro	
Sit down	Dafe	Furreeso	Tekemet	

English.	Dankalli.	Somauli.	Amharic.	Galla.
It is hot	Ne,e,ni	Wa kul	Ijig muket aleh	
It is cold	Dab,heni	Wa dahhan	Berd aleh	
I do not know	Ana mariga -	Aneka ma akan	Ing alawkim	
You do know	Atta tariga	Adeka wa takan	Ant tawkaleh	
Go away	Ebe i,ya	Tugh mesha-tun	Hid keziya	
Be not afraid	Ma mishitti	Ha bugin	At fira	

Visit to the Towns of Sehewan and Boobuk, and to the Lake of Munchur, in the latter end of August 1839. By A. B. Orlebar, Esq.

(*Presented by the Author.*)

The whole of the country from the neighbourhood of Hydrabad to the lake, with slight exceptions, is described as a low country, covered with tamarisk jungle, and now flooded by the waters of the Indus, which rush rapidly through the country, rendering the navigation extremely difficult, so that the native merchants dare not send their boats from Sehewan to Hydrabad down the stream, except under the care of pilots, who are paid five rupees for the trip. The danger of the passage was experienced by Mr W., who encountered a heavy fall of rain, with violent wind from the west, in coming down, and nearly lost his boat. In going up, it was necessary to pass up side canals, where the velocity of the stream was diminished. In attempting to cross on one occasion to the opposite side of the bank, where the current was less rapid, the boat was drifted two miles down. Mr W. complains much of the ignorance of the boatmen, who do not seem to be well acquainted with the nature of the river, and unable to make proper use of it. After the storm of rain above mentioned, the velocity of the current increased, and was full 8 or 9 miles an hour. The paddles which are in use, being seven feet long, two broad, and two inches thick, with contrivances to balance them on each side of the midship part of the oar, and pulled each by three men in the smaller dhondies, by more in the larger, must be of enormous power; yet Mr W.'s boat was got up the river by tracking.

The lake, at the time of his visit, (August,) was swollen by the influx from the Indus, and appeared 17 or 18 miles N.N.W. and S.S.E., and 8 or 9 from E. to W., but in the dry season it is reduced to a mere tank, a few miles in circuit,—those parts which are now two fathoms under water being then cultivated, and said to yield more than any other part of the dominions of the Ameers.

A low ridge of sand hills rises on the left bank of the Indus for several miles above Hydrabad. The Luckee mountains rise in a lofty range about 7 miles to the west of the river near the town of Sunn, and terminate at the junction of the Arrul with the Indus, whence a low range of sandhills, of a red colour, run northwardly for six or seven miles, and terminate in a tableland which overhangs the town of Sehewan.

The country about Sunn is an exception to the general wild jungle, very well cultivated with indigo and cotton.

The town of Sehewan is built of mud mixed with chaff, as strengthening it against moisture. Nitre is extracted from soil in the neighbourhood by boiling, and gunpowder is manufactured, and highly valued by the natives.

Boobuk is on the eastern shore of the lake, and about two and a half miles from it, being built on a mound in the midst of a flat. Carpets are manufactured here. There is a direct road hence to Kurrachee, whence is brought sugar-candy, fine sugar, black pepper, dates, copper, and iron, each at one rupee per maund; molasses at three-quarters; cocoa-nuts at one and a half; and Europe cloths at two annas per piece.

Alligators are caught and eaten by the natives, but are not known to attack men.

Report on the Arrul River, Lake Munchar, and the River Narrah. By R. C. KNIGHT, Esq., Acting Assistant-Surgeon, Indus Flotilla.

(*Presented by Government.*)

On the morning of the 19th June last we left Sehewan in the Honourable Company's iron steamer *Meteor*, and proceeded through the Arrul River towards Lake Munchar, and arrived at the spot where the river joins the lake in one hour and ten minutes from the time of starting. At this period, the current of the Arrul was setting westward into the lake at the rate of one mile and a half per hour.

This river branches off from a large ramification of the Indus, close by Sehewan. During the period of the inundation, the water of the Indus, rising above the level of Lake Munchar, regurgitates up this river into the lake, establishing a westerly current, until the main river begins to subside, when the lake being now the higher, an easterly reflux takes place through the Arrul. Like all the rivers in Sinde that I have seen, the borders of the Arrul present the same general appearance,—namely, they are skirted with the tamarisk, unless where it gives place to patches of cultivation, of which the northern banks showed more marks than the southern. Its breadth is from 120 to

140* feet, average depth of the fair channel from 15 to 18 feet, and, judging from the appearance of the banks, the water seemed to have risen to within a foot, or nearly so, of its greatest height. The channel winds considerably, but is perfectly clear of all obstructions: its average course is nearly due east and west, and the distance from Sehewan, where it enters the lake, is 10 or 11 miles.

Steering into the lake in a westerly direction for a short distance, and gradually hauling up to the north-west, with variable soundings of from three to eight feet, we entered, about four miles from the Arrul, the fair channel, which winds through a huge field of lotus plants that cover the surface of the lake for miles, intermingled with clumps of long reeds and rushes. This channel, at the time we passed through, was from 12 to 14 feet deep, general breadth from 35 to 45 feet, and it is as well marked as any channel can be—the lotus leaves floating on the surface of the water on each hand marking it as accurately as if a line of buoys had been laid down for the purpose. It appears to be in the very centre of the lake, traversing it in a north-westerly direction; and when we passed through, the water was still, or at least there was no appreciable current. The stillness of the water, and the non-existence of lotus in this channel, may be accounted for from the fact that the Arrul at one end of the lake, and the Narrah river at the other, pouring their waters simultaneously into its basin, must at length neutralise any pre-existing current; but when the main river subsides, and the waters of the lake once more flow through the Arrul, a current must doubtless take place in this channel—thus keeping it clear of the lotus, and so disturbing the plant as to prevent its taking root.

We passed two or three large cargo-boats lying here, and several fishermen with their families were observed here and there following their occupation in small boats, which glided about over this great lotus field.

About an hour and three-quarters' steaming carried us out of the channel into clear water, having patches of a small plant like common sea-weed floating under its surface: depth of water from 6 to 7 feet, gradually deepening to 10 and 12. In one hour of the time of leaving the lotus field we had crossed the lake, and reached the clumps of long reeds and grass which line its northern and eastern borders—the whole having the appearance of a large marsh, with openings at intervals, sufficient to admit boats of small burden. † Steering along the verge of this mass of reeds and grass, gradually hauling up in a north-westerly direction, in one hour more we arrived at the entrance of the Narrah, which is here a rapid, muddy stream, about 40 feet broad and 6 feet deep, obscured‡ and impeded by large clumps of long grass and

* This is not from actual measurement, but merely on estimation.

† Here we met nine small cargo-boats laden with grain.

‡ So obscured was it, that we took on board a fisherman, whom we found at

elephant reed. It is very tortuous, and sets into the lake from the north-east. The velocity of the current at this time was three miles per hour.

The above-mentioned obstructions could be easily cleared away, and a good fair way opened at very little cost. Meanwhile, so dense are those clumps of reeds, &c., that even native boatmen, as I have been informed, sometimes have a difficulty in finding the mouth of the river. In consequence of the winding of the stream, the eddies and shallows, and no doubt the peculiar build of the vessel, she answered her helm so badly that she went bumping along against the banks, right and left, at short distances, unless it was when we occasionally got into a long straight reach.

In shallow water her helm was nearly useless. As we proceeded up, the river gradually widened to 70, and at some places to more than 100 feet, the lead giving on an average from 6 to 11 feet depth of water; the banks became clearer of jungle, and the country also more open, stretching away in level alluvial plains. Villages, or collections of herdsmen's huts, built of wattles and other temporary materials, were spread over the country, but more particularly close by the river. There were flocks of buffaloes here and there, and sheep of most excellent quality and goats seemed abundant.

About eight miles above a large town on the left bank of the river, named Meer Mahomed Sheerah, the stream divides into two branches—the one N. ½ E., the other to the N.E. by E. The latter branch, which is called by the natives Kootaar, we found to be the proper channel,* but obstructed, about four miles above its mouth, by a large bund thrown across near a village called "Chunnah;" as well as another three or four miles farther up, opposite a village named "Gaha." About midway between these were the remains of an old bund, which gave us considerable trouble in consequence of the narrowness of the openings.

The "Kootaar" is about 50 feet broad, at the entrance 83 feet deep; it contracts a little as you proceed up towards the bund of "Chunnah," but before reaching that spot, it expands to about 100 feet in width; its average depth throughout is from 5 to 8 feet.

hand, to act as pilot. By his direction we came to the mouth of the river, about 200 yards only above the place where we took him on board.

* About one mile and a half above Meer Mahomed Sheerah, a branch called the Giddur debouches into the main stream from the N.N.E. It averages from 18 to 26 feet broad for about three miles above its mouth, and then, according to the native account, expands into a broad stream of about 100 feet. Semi-segments of the paddles were taken off, and angles of the banks were cut away, for the purpose of tracking the vessel up to the broad part of the stream, but after proceeding up about 200 yards, we were obliged to abandon the attempt, after three days' hard labour. The Giddur would seem to be the branch taken by the native boats to get into the main stream above; and I am inclined to believe this, because, though comparatively narrow at its mouth, it is of considerable depth—about nine feet in mid-channel, with a current running at the rate of two and a half miles per hour.

For 2 or 3 miles up from its mouth this channel is beautifully picturesque: its margin is overhung with tamarisk trees, creepers, and underwood, which line it to the water's edge; and its right bank is studded for some distance inland with babool trees of great size.

On arranging with the native authorities, labourers were set to work, and an opening of about 32 or 33 feet wide in each of the above-mentioned bunds was soon effected.

The upper or largest bund is, as before stated, close to "Gaha," a village situated on the right bank of the Narrah and Kootaar. The bund crossed the latter stream in a north-westerly and south-easterly direction, shutting off the waters of the Narrah, which at this place is a fine river 104 * feet broad, and $8\frac{1}{2}$ deep, with a current setting south-easterly at the rate of 2 miles per hour. Here all our difficulties were at an end.

This river, though exceedingly tortuous, maintains† nearly the same breadth as given above, contracting and expanding here and there, whilst the depth amounted from one fathom to sometimes three and a half.

The vessel now answered her helm pretty well, excepting occasionally at sharp turnings of the river, when her bow was caught in the strength of the current.

From Lake Munchar up to the bund of "Gaha" the country appears to be moderately well cultivated. The inhabitants seemed wretchedly poor, if we may judge from their general appearance, which had not the clean substantial aspect of those who reside higher up the river. Along the banks of the Narrah, or main stream, from "Gaha" to where it joins the Indus, are many well-built large villages, interspersed with those of the less permanent materials above mentioned.

Water-wheels, in full working order, are fixed at longer or shorter intervals on each side of the river; but though the cultivated lands had a very refreshing appearance, and looked vigorous, it was easy to perceive from the tamarisk, milk-bushes, &c., left growing here and there in full strength in the midst of the crops, that cultivation is performed in a very slovenly style.

Various kinds of trees of great size grow on all sides, and would yield plenty of timber for the construction of water-wheels and other agricultural purposes. Large droves of water buffaloes were passed at frequent intervals. Droves of cows, and flocks of excellent sheep and goats, were seen scattered over the country. The chief articles of cultivation at the time we passed through, and those principally close along the margin of the stream, were cotton, sugar, and rice.

On the main stream, that is, between the Gaha and the Indus mouth of the Narrah, there appears considerable traffic. We passed boats of

* By actual admeasurement.

† The first day, in the course of our passage up from the bund of "Gaha," the vessel's head was five times on every point of the compass, so winding is the course of the stream.

various sizes, some lying near the different villages, others proceeding down the river laden with grain and fodder; and the people, in apparently better plight than their brethren lower down the river near the Munchar, showed fewer signs of poverty, and pestered us less with begging.

In consequence of the vessel steering so badly in that part of the river between the Munchar lake and the Kootaar, it is difficult to form an estimate of the distance; but I am inclined to reckon it at about 60 miles, *i.e.*, from the Lake to the bund of "Gaha."

From the latter place to the Indus the vessel was under steam for 63 hours. The first 40 hours' average, strength of current against us, 2 miles per hour; next 15 hours, 3 miles; next 8 hours, 4 miles per hour: and assuming 7 miles per hour as the average speed of the vessel, we thus have the average distance from the village of "Gaha" to where the Narrah joins the Indus (28 miles below Sukkur) 284 miles. I calculate that a vessel of the same horse-power as the *Meteor*, viz., 24 h.-p., did she steer well, might make the passage from Sehewan through the Narrah to the Indus, during the months when the river is high, in about 80 hours' steaming, exclusive of the time consumed in taking in fuel. Thus, from Sehewan to the Munchar mouth of the Narrah, 5 hours; from Lake Munchar, 6; "Gaha," 12 hours; and from "Gaha" to the Indus, 63 hours. A steamer, to ply successfully on the Narrah, should, I think, not be more than 80 feet in length and 16 or 17 feet broad, measuring from the external rings of the paddles, draught from 2½ to 3 feet; and *she must steer well* in shallows, and obey her helm quickly in her own draught of water. Plenty of fuel could be had, particularly about the upper part of the river. To native craft, or boats of any description, the navigation is remarkably easy and perfectly safe, the water being quite smooth and the average strength of current not very great, except near to where the Narrah joins the Indus.

They *pull* along with ease, track where the jungle on the banks permit it, or take advantage of breezes when they can; and though the turnings and windings of the river are often sharp, yet the currents which sweep around them bear no comparison to those in the Indus, which render the navigation there both tedious and dangerous.

(Signed) R. C. KNIGHT,
Acting Assist.-Surgeon Indus Flotilla.

SUKKUR, *July* 31, 1841.

Letter from Colonel H. POTTINGER *to the Political Secretary to the Government of Bombay, dated 22d April* 1839, *No.* 424, *forwarding herewith Copies of Reports on the Garrah Creek, (and the Route from Kurrachee to Tattah.)* By Lieutenant BUCKLE, of the I.N., and Lieutenant MACLEOD, of the Bombay Engineers.

(Communicated by Captain D. Ross, F.R.S., President.)

SIR,—1. With reference to my letter No. 297, of the 12th ultimo, I have the honour to forward herewith copies of Reports on the Garrah Creek, (and the route from Kurrachee to Tattah,) by Lieutenant Buckle, of the Indian Navy, and Lieutenant Macleod, of the Bombay Engineers.

2. I also forward a "Compass Sketch" of the Garrah Creek, from which the Honourable the Governor in Council will perceive that it is in reality connected with the harbour of Kurrachee; and although Lieutenant Macleod states that it is not pervious "after the monsoon sets in," yet, both from my own inquiries and from Lieutenant Buckle's silence as to that point, I suspect it must be a mistake, and that, with the exception of occasional stormy periods, the passage from Moonorah Fort to Garrah will be found practicable throughout the year. This question will, however, be easily and finally settled during the approaching south-west monsoon.

3. On my route from Tattah to Kurrachee, I came down the creek from Garrah, and can vouch, from personal observation, for the minute correctness of the sketch which I now submit. The road from Tattah to Garrah was repaired when I passed, as far as the village of Gundah, and very little will make it fit all the way for wheeled carriages during the dry season; but from the nature of the soil, which is alluvial, and the lowness of the face of the country, which causes much of it to be overflowed during the inundations, I doubt whether it will ever be possible, without an enormous expense, to make it permanent, or such as could be used even in wet weather.

4. I accomplished the trip from Garrah to where I landed on the sandy point, on the western side of the Ghisree Creek—which is a blind one, and only runs up a mile or two—in less than thirty-six hours—twelve of which we were anchored—against a strong foul wind, which prevented our hoisting sail except for the last six miles, where the river was sufficiently broad and deep to enable us to tack. I met two officers—Captains Corsellis and Miller—at Goojah, who had come from the shipping in Kurrachee harbour to Garrah in one tide, so that the facilities which this fine creek affords for rapid communication, and transport of goods into the country, may be said to be already demonstrated, and it is a curious proof of the ignorance in which we have been kept by the suspicious jealousy of the Scinde Government,

that it has hitherto been unknown—even to our commercial agents, who formerly resided some years both at Tattah and Kurrachee,—and was only lately discovered by Naomull, the Kurrachee merchant, casually suggesting "that we should move our stores by it."

5. The Jam of Garrah paid me a visit at Tattah, and personally expressed, as he had previously done through others, his perfect readiness to meet our wishes in every respect as to the use of the creek and his town, which he particularly explained he held on independent tenure. He said that in very good seasons he had rarely received as much as four thousand rupees in export and import duties; that the average might be nearly three thousand rupees per annum; but that for the past two years he had not got above two thousand, and this year not a fourth of this latter sum, owing to all the produce in grain, ghee, &c., which commonly comes for shipment to Garrah, having been drawn off by the demands of our troops. He further told me, that the protection of the roads and the country lying between Kurrachee and Tattah, was assigned to him as the head of the Jokhya tribe, but that the Ameers were bad paymasters, and that he had not the means himself of keeping up a sufficient body of troops. He said he would, however, be answerable for the safety of all our supplies, and hoped that the British Government would look on him as their well-wisher and servant.

6. I assured him, in answer, that his good and friendly conduct would not be overlooked, that I would bring it to the special notice of my superiors, and that I depended on his aiding in every way, by his influence and means, in expediting the safe conveyance of the stores and supplies for the army in advance, to the bunder at Tattah.

7. I would respectfully advise that the Jam might have a present of one thousand rupees as a reward for his obedience, and some compensation for the use we have already made of his town and creek. The officers of the Indian navy who will be at Kurrachee in the monsoon months, should be directed by the Superintendent of the Indian navy to pay particular attention to the state of the Garrah Creek during that period. I understand that several of the channels that run *into* it from the eastward, lead into the larger branches of the Indus during the time of the floods, and that there is actually from June to August—both inclusive—an inland navigation as it were, by which boats might proceed from Kurrachee to Luckput bunder in Cutch. All this should be, I think, carefully looked into, and the possibility of deepening the creek above Garrah so as to extend the *salt* water conveyance to near Goojah—to which village small "Doondees" come from the Indus when the waters are abroad—will form another interesting and important subject of inquiry, to which, perhaps, the attention of Captain Harris, the field engineer, might be advantageously directed.

8. Whatever may be the footing on which Kurrachee will be ultimately placed by his lordship the Governor-General, it seems to me

quite clear, that the Creek of Garrah must always form a most valuable appendage to that port, and I intend, in due time, to submit a recommendation that the Jam shall be paid an annual stipend for the free and unlimited use of this remnant of his patrimonial possessions. The sum will be small; and, exclusive of the justice of considering the Jam's claim, our doing so will have an excellent effect, and will redound greatly to our credit amongst all classes of the people of Scinde.

9. As I have not another copy of the "Compass Sketch," I beg that one may be taken, and that which I herewith send returned to me. If two other copies could be conveniently prepared in any of the public offices for transmission to the Governor-General and Government of India, I should be much obliged, and I request you will favour me by obtaining the sanction of the Honourable the Governor in Council for this being done.

I have the honour to be,

Sir,

Your most obedient servant,

(Signed) HENRY POTTINGER.

BOMBAY, *22d April* 1839.

Report on the Nature and Extent of the "Garrah Creek," and the State of the Road between the Town of Garrah and Tattah. March 1839. By Lieutenant G. MACLEOD, Bombay Engineers.

(*Communicated by Captain D. Ross, F.R.S., President.*)

The mouth of the Garrah Creek is situated at the eastern extremity of a large bay, nine miles E.S.E. of Munora Fort. Immediately above this bay is a smaller one terminating in a creek, called the "Ghisree Creek." The only inlet to these bays is an opening 120 yards broad, in a long line of sand banks, which, in consequence of the surf, is impassable after the monsoon sets in. During that season boats to and from Garrah embark and disembark their cargoes at the Ghisree. This, as well as the bay into which it runs, is very shallow, the average depth of water being 6 feet. Between the inlet above alluded to, and the mouth of the Garrah Creek, the navigation is rather intricate, owing to the numerous sand banks, but on the proper course the depth is 20 feet, and as you approach the mouth 25. At the entrance on the right is a long sand bank, between this and the shore the depth is 25 feet. At the mouth, which is 300 yards broad, the left bank slopes off gradually: in the centre the depth is 30 feet, and close to the right bank 20. For 4 miles the creek winds in an easterly direction, the depth being the same, but the breadth increasing to 500 yards.

Thence, turning off to S.E. it suddenly contracts to 150 yards, banks steep, and depth averaging 20 feet. The hills, which hitherto lined the shore on the left, here run inland, and both banks are covered with a low jungle, which on the right extends some distance into the country. For the next four miles the breadth and depth are the same, 3 or 4 small streams branch off, down which the natives bring firewood from the jungle. After this, hills again line the left bank, the right being low up to the town of Garrah. At about eleven miles from the mouth, a creek branches from the main one, 3 or 4 miles in length, passing close to Wuttajee, a resting place on the land route. The main creek at this branch is about 400 yards wide, but soon decreasing to 150 yards, winds to the right of a musjid standing on an eminence. Four miles higher up, and at about 10 miles from Garrah by the course of the creek a bend runs due north—breadth at low water 120 yards, and depth 20 feet. The right bank hitherto is the steepest, in many places almost perpendicular; here, however, for the distance of about a mile boats keep close to the left side, breadth decreases to 80 yards, and depth to 12 feet. A boat of 25 candies can at low water get within six miles of the town, where there is five feet of water. At high tide the depth increases to 12 feet, and boats lie alongside of the town in 8 feet of water. Although the bed of the creek for the last four miles is from 80 to 50 yards broad, a space of about 10 yards in the centre is alone navigable. Goods are landed on a firm bank, without any trouble or delay. A boat leaving the mouth immediately after low water, would, with tolerable luck, get up the same tide. The distance by the windings of the creek is 25 miles, judging at the rate we sailed up.

The communication between Ghisree and the town of Garrah is open at all seasons, and, except during the monsoon, much trade is carried on from the interior with Kurrachee, Soumeanee, and other parts of the coast. After a favourable monsoon, the natives during the fair season erect temporary huts on the banks of the creek and live there. This, however, at present is not the case, owing to the scarcity of rain for the last three years. Two years ago pearls were discovered at the mouth, and the right bank is strewed with shells. The specimens I saw, however, were very small.

The town of Garrah stands on an eminence on the left bank of the creek. It consists of about 200 mud houses. The inhabitants are composed of Mussulmans and Hindoos—chiefly the latter. The cholera, raging here a month ago, is said to have carried off 65 persons. The country, in the vicinity of Garrah, presents a parched up, desolate appearance, without any signs of cultivation—nothing is to be seen but sandy hillocks rising one above another, thinly covered with low jungle. The creek winds round the town and a long way towards Tattah. It is not, however, navigable above Garrah. The town possesses within itself no resources whatever, and derives its sole importance from being situated on the banks of the creek. It is the medium

ASIATIC

through which much trade is carried on from the interior. Large quantities of grain of all descriptions, and ghee, are exported. The Jam, to whom the place belongs, levies a tribute of 4 per cent. on all merchandise passing up or down the creek. The country in the neighbourhood of the Mullur river also belongs to him. His yearly income amounts to about 3000 rupees. There are two wells of good water at Garrah, and any quantity could be obtained eight feet below the surface of the ground. The following shows the prices of the different kinds of grains, &c., procurable, and the rates—which, as will be seen, are dearer than at Kurrachee :—

Rates at Kurrachee.	*Provisions.*	*Rates at Garrah.*
10 Pucca Seers per Rupee.	Bargerie	10 Pucca Seers per Rupee.
8 „	Rice 1st sort.	7 „
9 „	Do. 2d „	9
22 „	Do. 3d „	13 „
12 „	Huldee.	9 „
20 „	Dates.	7 „
9 „	Moong.	8½ „
3 „	Best Pepper.	2¼ „
51 „	Onions.	25 „
8 „	Sursee Oil.	8 „

In addition to the increased rates at Garrah, the seer is less than at Kurrachee.

1 Kurrachee Pucca Seer weights 72 Cassanee Rupees.
1 Gahra ditto ditto 62 do. do.

Fuel is plentiful. Grain is not to be had, and very little grass. Rice kurba is the only substitute, and that is dear; 4 annas is asked for what would last one horse for two days. A few fowls are procurable for half a rupee each. Goats in abundance at the same rate. The jungles round Garrah are filled with camels, and the natives use them, more commonly than is the general custom, as beasts of burden. They ask from 30 to 40 rupees each for them. Male camels are scarce, and must be procured from Meerpoor, about 14 miles distant, and the surrounding villages. The price is from 50 to 60 rupees each. There are no bullocks on the spot, and when any are required they are brought from Goojjer, a town 12 miles off. They are, however, of a far inferior kind to the Kurrachee ones in every respect; the price varies from 7 to 12 rupees. Bullocks are hired between Garrah and Tattah at 1 rupee and 2 annas each. Camels, 1 rupee and a half. 100 camels and from five to six hundred bullocks might be assembled at Garrah on a short notice.

The first village on the road between Garrah and Tattah is Gundah—distant from the former 5 miles 3 furlongs. The first half mile runs along a sandy ravine, with merely a footpath, irregularly beaten, from thence along the bed of the creek; the road then ascending, lies over a level plain, thinly covered with jungle. Within half a mile of Gundah a branch of the creek again intersects it, and thence to the village it is very uneven, and the jungle thick. From Gundah to Goojjer, distant 6 miles 5 furlongs, the road is rough and uneven. Three quarters of a

mile from the former is a nullah, and another one, deeper and broader, half a mile from Goojjer. From Goojjer to Tattah, distant 9 miles, the road is generally very bad for wheeled carriages. Half a mile from the former is a large nullah. The general state of the road between Garrah and Tattah requires to be much improved to render it passable for wheeled carriages. The beds of the creek and nullahs must be sloped off, and in some parts filled in, and the jungle cleared.

At Gundah, a village consisting of 7 or 8 straggling huts, are two wells of good water; fuel in abundance. For the next ten miles the country has a more cultivated appearance, and resembles a large meadow some miles in extent. Between Gundah and Goojjer sheep were seen grazing.

The town of Goojjer stands on a rising ground; during the rains it is insulated; there are several wells of good water, and abundance of fuel. Bargerie, rice, and dates are to be had, but much dearer than at Kurrachee. It is from hence bullocks are taken to Garrah, at the rates before specified.

At a distance of 6 miles 1 furlong from Goojjer, on the road to Tattah, is a large well of good water; half a mile on the right is the village of Murkar.

Within three quarters of a mile of Tattah the country takes a sudden fall all round, and the city stands in the plain below. Should wheeled carriages have to descend the hill, a road must be made; at present there is nothing of the sort.

The general direction of the road from Garrah to Tattah is due east; the distance, measured with the perambulator, 21 miles.

From Garrah to Gundah,	.	.	.	5 miles	3 furlongs.
„ Gundah to Goojjer,	.	.	.	6 „	5 „
„ Goojjer to the well near Murkar,			.	6 „	1 „
„ The well to Tattah,	.	.	.	2 „	7 „
From Garrah to Tattah,	.	.	.	21 miles.	

On the land route from Kurrachee to Garrah, water is procurable within every ten miles; but the road is everywhere bad for wheeled carriages, and would take a long time to put in order. The route by water is in all respects preferable, but during the monsoon the boats will have to be loaded at the Ghisree, to which place the road requires much to be done to. The distance from Kurrachee is six miles. I speak of one by which I returned, but I should imagine that for carriages a circuit of two or three miles would be necessary, thereby lengthening the distance to 8 or 9 miles.

(Signed) GEORGE MACLEOD,
Lieutenant Engineers.

CAMP NEAR KURRACHEE,
March 14, 1839.

Route from Deesa to Sukkur, with Topographical Observations on the Desert; being the Direction or Line of March performed by the 6th Regiment N.I. in 1840. By Captain DEL'HOSTE.

(*Communicated by the Author.*)

One of the first geographical papers written by the late Sir Alexander Burnes was, "A Memoir on the Eastern Branch of the Indus," dated in March 1827. This interesting report was presented by the Honourable the Governor in Council to the Bombay Literary Society. It contains a very able description of the Runn of Cutch, the Koree or eastern *mouth* of the Indus, and the alterations caused in that very singular portion of country by the earthquake of 1819, with remarks on its former state.

At the period when the report alluded to was published, Scinde may be said to have been *terra incognita*, and notwithstanding the anxiety which the late Sir Alexander Burnes felt to explore that country, the jealousy and suspicion of the Ameers was an effectual bar to his doing so.

If the memoir in question is referred to, it will be seen that a vital blow to the interests and revenue of the province of Cutch was inflicted by Goolam Shah Calora in the year 1762, who, by throwing up an embankment, called in Scinde a bund, on the eastern branch of the Indus, at the village of Mora, prevented the waters of the Indus from reaching that portion of the Cutch territory called Sayra—until then a fertile tract. At the time Sir Alex. Burnes penned the fact above recorded, he must have depended for his information on native authority —where the bund alluded to, or the village is, I have been unable to discover. Goolam Shah Calora threw up a bund at Mora on the Indus, to prevent that village and one near it named Gujjera from being carried away by the inundations of the river—and a most beneficial work it proved. If the waters of the Indus on its eastern bank were obstructed by him, it is *probable* that the *Arrore Bund* was the spot, but this is merely a conjecture.

It was my good fortune to be selected, in August 1840, to conduct the 6th Regiment N.I. overland from Deesa to Sukkur, and thus to have had the opportunity of following the eastern branch of the Indus from Omercote to within a few miles of the Indus near Roree, (the details of that journey are before the Society,) and to complete the survey the eastern branch requires to be traced from Omercote through the Thurr, down to near Raoma Bazar, where the Narrah debouches, and where a vast sheet of water is said to exist, and from thence to Lugput, to complete our knowledge of it.

During the period I was in Scinde in 1832, I first heard of the Narrah, or eastern branch of the Indus, and from the intelligence I procured

there, I was enabled to follow up that branch from Omercote in 1840. I have, since then, made many inquiries regarding that portion of Scinde, and, amongst other information, the following singular traditions were made known to me.

It is said that about 150 years ago seven holy men were unjustly put to death near Halla; that after their heads were struck off a voice issued from *their bodies*, and pronounced twenty-two prophecies regarding Scinde; of these, nineteen are said to have been fulfilled—those I had not time to write down: the three last are as follows:—

That Scinde shall be conquered by an enemy coming from the *north*, although it shall be threatened from the *south*.

That fire shall appear in the southern part of Scinde, near Gorabaree.

That when the Arrore Bund is broken, happiness will be restored to Scindee and Scindree.

The latter runs thus—

Bhagey Bund Arrore
Sook wa Scinde wa Sindree,
Mir Michi Keysa phar,
Zalun mattee do chotree,
Murdun muttee bal,
Tunny sund a bal,
Punch y dubbi waitchee.

Which, being translated, may read thus—

When the Arrore Bund is broken,
Happy will be Scinde and Sindree,
How know you the (Ameer) Reloochee,
Their women wear their hair in two knobs,
The men in one.
A time will come when their children
Shall be sold for five pice a piece.

With respect to the first, it is singular that an army, in 1838, *threatened* Scinde when advancing from the *south*, but did not take it until coming from the north. The prophecy has, however, been fulfilled.

The comet is supposed to be the fire alluded to in the second, and the third remains yet to be accomplished.

I have never visited the Arrore Bund, but it will be found described in "Burnes's Travels into Bokhara." How far it influences the Narrah I cannot therefore determine, but the natives of Scinde assert that it is the obstruction to the waters of the Indus passing by the eastern branch, and that, on any unusual or exceeding inundation taking place, the waters pass over the bund, and the Narrah is filled.

The Narrah, as will be seen by the accompanying map, leaves the Indus some short distance above Roree, and runs down towards Omercote. The scale of the map is too small to show the singular features of the country through which this branch of the Indus passes. It is now a desert, overgrown with jungle of the most dense kind on

the one bank, and skirting the sand-hills of the Thurr on the other. In the valleys between the sand-hills extensive salt-lakes exist,* which are replenished from time to time, generally every three or four years, when the inundations are sufficiently great to admit of the Narrah being filled. There is no doubt of this branch being the Nalla Sankra, mentioned as the boundary between Khorassan and India, in a treaty with Nadir Shah and the Emperor of Delhi, dated, I believe, in 1727.

In my first journey in the vicinity of the Narrah, in February 1832, when proceeding with despatches for Meer Roostum Khan from Hydrabad to Khyrpoor, I traversed a portion of country covered with remains of old tombs, mounds of earth, denoting the site of villages,—ruined water-courses and canals, and other proofs of the existence of a flourishing and highly-populated country. In all probability, at that period the inhabitants of this part of Scinde were dependent on the waters of the Narrah for their support, and it is easy to imagine that by the waters being cut off the ruin of the country would follow. Tradition gives out, that the erection of the Arrore Bund caused the destruction of the fertile country along the banks of the Narrah, and the allusion to Sindree is so far singular, that it stood in the course of the Narrah on the edge of that fertile tract called Sayra. By the mention, therefore, of the Arrore Bund and Sindree, we have points at both extremities of the Narrah. Sindree was destroyed by the earthquake of 1819.

How far the removal of the Arrore Bund, and the other obstructions on the river, would tend to restore the country to its former state, it would be difficult to say, unless a minute survey of the Narrah was made. Where the water formerly continually flowed, and where it now partially does, I presume it might again be made to run. The Narrah was filled from bank to bank in 1831; in 1837–38, and in 1840, a partial rise in the Indus had caused the Narrah to be filled for thirty miles from the great river.

The traveller in Scinde cannot fail to remark the difference between the country near the banks of the Indus and those parts removed from it. Not above one-third of Scinde is under cultivation, and yet the uncultivated parts offer the same soil, and merely require water to render them as productive as the land near the river; and that many parts have been so formerly, the ruins I have before mentioned as having seen testify.

Admitting that the Arrore Bund was erected for the purpose of cutting off the waters of the Narrah, the question may be asked—For what purpose could such an act have been perpetrated? The natives give as a reason the rebellious disposition of the former inhabitants. How far this is correct it is impossible now to say; but it is a singular fact that deserts have been created on all sides of Scinde by its rulers.

* Although the water of the lakes is salt, excellent fresh water is found by digging a few inches near the edge of the lakes. It is supposed that the water becomes brackish from the saline nature of the soil—salt being formed along the edges of the lake as the water dries.

The desert of Kychee, between Scinde and Cutchee, was, in the memory of several people now alive, partially cultivated, a deep canal called the Meer Wah extending across it: this was destroyed by the Ameers, and a space of 30 miles is now as complete a desert as the Runn of Cutch. The bunds erected on the Narrah, the Alli Bund and others, those on the Pinyaree branch at Muggurbee and Bhorr, the bunds on the Goongroo and Gonee, all tend to prevent the waters of the Indus from reaching down to the Koree, or eastern mouth, and the country around it,—thus creating a desert of nearly 40 miles in breadth between Cutch and Scinde.

The obstruction of the waters of the Narrah has effectually caused a desert from near Roree to Omercote; and the western bank of the Indus, from Kurrachee to the Indus, may be also considered a desert.

When these facts are considered, and the vast portions of Scinde that remain uncultivated and useless are pointed out, it becomes matter of surprise that the country should have yielded a revenue of one crore of rupees. Yet such was the amount realised during the Calora dynasty.

I ought not to omit to mention that Meer Roostum Khan, of Khyrpoor, told me that the bund at Arrore was repaired by him in 1830, to prevent his territories from being inundated. The natives, however, with whom I conversed on the subject, told me the fact of the bund having been repaired was undoubted; but the cause was not the true one, and I have full reliance on this, for between the territories of Meer Roostum and the Narrah river a line of flint and limestone hills extend, running upwards of 40 miles south from Roree, and where the range terminates, high sand-hills in many places intervene. I can hardly imagine, therefore, that the inundations from the Narrah could affect the Khyrpoor vicinity.

We have now possession of Scinde; and I conceive that one of our first objects should be to conciliate the *working classes*,—Hindoos and Scindians,—and I know no better method of benefiting the country than by opening some of their bunds, especially in the vicinity of Bhoor and Muggurbee. I conceive it possible that the tract of country between Bhoor and Luckput might be rendered fertile and productive: that it has formerly been so does not admit of a doubt, for I saw the trunks and roots of trees and bushes covering the desert, and the soil is as good as the best in Scinde, and merely requires water.

It is well known that Cutch has frequently suffered from famine, being dependent on the periodical rains alone for its produce of grain, and from its position nearly on the tropic, the rains are frequently very light, and at all times uncertain. This was not the case when Sayra existed; and although from the changes caused by the earthquake of 1819 it may not be possible to restore that tract to its former fertility, it doubtless would be perfectly feasible to grant the tract of land between Bhoor and Kotree, which, by opening the bunds on the Goongroo and Gonee, might be rendered highly productive.

It is to be hoped that a new light will break over Scinde by its hav-

ing become a British province. By the oppressions and tyranny of the Ameers all industry was paralysed, the cultivator barely received one-fourth of the produce of his land,—one-half was taken by the Ameers, and one-fourth more fell to the share of those who collected the revenue. No wonder that extensive deserts occur in Scinde.

Should the prophecy be fulfilled by our destroying the Arrore Bund, and opening the others alluded to in the former page, we shall be effecting a great work and doing justice to the people, as well as rendering our new territory more approachable.

Luckput would probably rise into consequence, and the district of Lah, now a desert, become a fertile country, thus affording an easy access at all times into Scinde. The wretched population of the country —Hindoos and Scindians—merely want protection and encouragement to become industrious; and, fostered by British care, Scinde and its people will, ere long, become one of the richest provinces in the world.

I trust, therefore, it will not be many years before it may be said with truth—

"Bhagey Bund Arrore,
Sook wa Scinde wa Sindree."

(Signed) EDWARD P. DEL'HOSTE,
Captain, Acting Deputy Quartermaster-General.

BOMBAY, *June* 24, 1843.

Some Account of the Koree or Eastern Branch of the Indus. By B. A. R. NICHOLSON, Esq., Civil Surgeon. April 1842.

(*Communicated by the Author.*)

In the beginning of June last (1835) a friend and I being at Luckput, in the course of our inquiries made relative to the Koree or Eastern Branch of the Indus, we were not a little surprised by an old muchee-walla informing us that there was a ford perfectly passable on foot at low tide, about five or six hundred yards above the bunder. We, doubting the information, immediately repaired to the spot, from which a man started and walked across to the other side—we were certainly astonished at finding a ford not exceeding the depth of three feet in any part. The bottom is composed of tolerably firm clay, but would not bear horses, &c.

I mention this merely as an instance of the uncertainty of the navigation in general of all large rivers, the courses of which, towards their embouchure, lie more or less through a low, sandy, or muddy country —as the Nile, Ganges, and Indus—owing to the continual undermining and falling in of the banks, as well as inundations, altering, or partially filling up the bed of the river. The changes in this branch have

been very great, not so much from the causes just mentioned, as by human agency assisted by a convulsion of nature. Prior to 1762 it was a large fresh-water stream; a bund was then built across by the Scindians, which reduced the stream to less than one foot in depth.

From this time it continued a general ford for beasts of burden (principally carrying rice to Luckput) till 1819, when an earthquake threw up Ullah-Bund, entirely cutting off all communication between the Indus and the Koree, and from the date of this occurrence, the tides have flowed considerably above Luckput.

By a note in the 3d volume, page 312, Burnes's Bokhara Travels, I learn that Captain David Wilson, of the Bombay Army, found a ford here in 1820. In 1826, Burnes, and I believe in the same year Colonel Pottinger, found a depth of fifteen feet here, and in 1835 I again found only three feet of water! Yet none of the natives I spoke to on the subject were aware of any change taking place in the course of the Koree since 1819, since when it has ceased to be a frequented ford.

(Signed) B. A. R. NICHOLSON,
Civil Surgeon, Kattiawar.

RAJKOTE, 19*th April* 1842.

On the Advantages to be Derived from Establishing a Communication between Kurrachee and Jurruck, and making the latter the Port and Depot for the Indus instead of Tattah. By E. P. DEL'HOSTE, Capt., Acting Deputy Quartermaster-General.

(*Presented by the Author.*)

Scinde having been made a British province, and being likely to remain one, everything connected with it has become of interest, and the time has arrived when it is necessary to use every exertion towards its improvement. The expectations entertained in 1832 of its importance in a commercial point of view, have not, I believe, been realised; I speak doubtingly on this subject, however, not having had opportunities of instituting inquiry regarding it.

From being well acquainted with the country, as well as with the river, I can easily conceive that traders would meet with no small inconvenience, especially in the lower parts of the stream; these may be emunerated as follows:—

1. The difficult entrance or entrances to the Indus, which vary every year almost, owing to the changes which must naturally occur in a stream flowing through an alluvial country such as Scinde.
2. The transhipment of goods from the sea to the river boats.
3. From there being no large town or post within the river where boats may proceed to, and unload, in the event of river boats not being

ready to receive the goods,—the absence of storehouses for the goods, &c.

These are inconveniences which have no doubt been felt, and that severely, by the trader, and the remedying of which will be the first step towards improving the trade of the Indus.

From what has been said regarding the mouth of the Indus, I am no advocate for its being the commercial entrance to Scinde,—the danger of crossing the bar, and the delay of tracking up the river, added to the other inconveniences already mentioned, are my reasons for objecting to it.

I would, therefore, propose, that Kurrachee should be the sea-port for all vessels proceeding to Scinde, and Jurruck the river-port or depot on the Indus.

Kurrachee is well-known; it affords a good harbour for small vessels; and were a pier or jetty erected near the landing-place, it would prove a most convenient port.

The nearest place (to Kurrachee) on the Indus is Tattah, which it was intended should be the depot on the river; but there are objections, and serious ones, to that town, which I will endeavour to describe.

1. The distance of the town from the Indus, and the uncertainty attending the course of the river near Tattah.

2. The impossibility of erecting the requisite storehouses, &c., owing to the above fact.

3. The unhealthiness of Tattah, which is proverbial in Scinde, and has been so for many years.

With respect to No. 1, I find from an extract from a report by Captain Hamilton,* who visited Tattah in 1669, that the Indus was then about two miles from the city. That owing to a want of rain a plague had broken out in the city, of which 80,000 people died.

* Extract from Captain Hamilton's Report on Scinde, 1669:—"In travelling from Dunghain (Query—where this place is, I have been unable to discover; perhaps it is Dumba marked on the map, but it is a long way from Tattah) towards Tattah, about four miles short of the city, on smooth rising ground, there are forty-two fine large tombs, which from the plain appear to be a small town; they are the burying-places of some of the kings of Scinde, when that country was governed by its own kings. Tattah city now stands on a spacious plain, and they have canals cut from the river that bring water to the city, and some for the use of their gardens. The king's gardens were in pretty good condition, and very well stored with excellent fruits and flowers, particularly the most delicious pomegranates I ever tasted. For three years before I came there had been no rain, which caused a severe plague to affect the town and circumjacent country to such a degree that in the *city only* 80,000 died of it that manufactured silk and cotton, and above one-half of the city was left empty, being deserted. Tattah is the emporium of the province, and a very large and rich city; it is about three miles long, one and a half broad, and is about forty miles distant from Sharry Bunder. It has a large citadel on its west end, capable of holding 5000 men and horse, and has barracks and stables convenient for them. The Portuguese had formerly a church at the east end of the city. The house is still entire, and in the vestry are some old features of saints, and some holy vestments, which they proffered to sell, but I was no merchant of such bargains."

In 1832, when I first visited Tattah, the port was four miles distant from the city. In 1838-39, when the 26th Regiment Native Infantry was stationed at Tattah with a company of Artillery, they lost 4 officers, and I believe 180 men, and not a *soul*, either officer or private, escaped the fever which prevailed at Tattah, and usually does so annually after August. In December 1839 I encamped the corps at Kurrachee, and *saw* upwards of 300 of the men sick—*all* had had the fever, and looked like ghosts; the strongest as well as the weakest were attacked—there was no distinction—nor did the disease disappear until the end of January or beginning of February.

In 1841, when I again visited Tattah, the distance from the bunder to the town had increased to five miles (I had no means of judging, beyond the statement of the people, and the difference between the distance of the two places in 1832.) It is now, I hear, seven or eight, a wide bed of the river deserted by the stream, intervening between the city and the port. These are objections which I conceive sufficiently strong to bear me out in the opinion formed. It need scarcely be said that where the river is subject to such changes, it would be useless to go to the expense of erecting either storehouses or wharves.

If, therefore, it can be proved that Jurruck has none of these evils to contend with, my object in recommending it as the depot on the river will, I trust, be seen and approved of.

I shall therefore proceed to give an account of it, drawn up in 1840.

This report will be accompanied by a survey of Jurruck and sketch-map of Scinde, which I trust will fully illustrate the subject of this Paper.

Jurruck is a town on the right bank of the Indus, belonging, I believe, to Meer Mahomed Khan; it contains a population of 4000, and occupies an irregular space of seven furlongs in exterior dimensions: the situation is good, both as regards salubrity and defence, the hills A and B commanding the approaches to the town on the river and land sides; the low grounds N. and S. are not inundated on the rising of the river, nor do I perceive the slightest difference in the course of the river at this point since last here, in May 1832. The town is raised 150 feet above the river; and from the minute account of the state of health of the people which I obtained, it appears to me that sickness during last year has been less prevalent here than in any other village near the river in Lower Scinde.

Inhabitants.—The inhabitants and the authorities were most civil and attentive, and spoke in raptures of the discipline, honesty, and good behaviour of our troops when passing through their town: they anxiously (they said) hoped a post would be stationed there, which they seemed to infer from the survey I was carrying on, and to which they did not make the least objection.

Bunder.—The present bunder is nearly east of the town, at the spot marked C; but I consider that if this is made an entrepot for stores, the most eligible position for one would be at D, and the high ground above it an excellent situation for store-rooms, &c.

Supplies.—Supplies are abundant: there were no less than 200 shops, and the bazaar covered in with matting: the water is brought from the Indus, and also, after rain, procurable at the tank north of the town.

Country or the Vicinity.—The country north of Jurruck is an extensive plain covered with grass and bushes, and cultivated at the proper season; a bund extends from the hill N.E. of the town for nearly two miles, by which the water from the river is prevented from overflowing the plain. The country is hilly and gravelly from N.N.W. to S.S.W., the intermediate point being low. I cannot see any reason for believing that this place would prove unhealthy; the only places where water lodges are at Sal, nine miles north, and at or near Doondey, about the same distance east; both are bunds, which are drained off as soon as the inundations subside.

Tattah and Sehewan.—At Tattah and Sehewan there are marshes which nearly surround both places, and the dense jungle above the former place is of itself a nest of fever; the country to be passed over from Kurrachee to Tattah, is partly subject to inundation, and that between Sehewan and Kurrachee choked with jungle in several places; added to which, I do not believe that in the hot weather water would be found at the halting places. Were it abundant, the Looniries and Tokeas would not retreat, as they usually do, to the Hubb river during that period.

*Roads compared.**—The roads leading from Kurrachee to Jurruck are all good; the average period laden camels take to accomplish the distance is five days by the direct road to Kurrachee, six if *via* Garrah, three of which are employed in reaching that place.

Garrah Creek.—I do not think a sufficient consideration has been given to the advantages derivable from the Garrah Creek; it will be (in my opinion) of the greatest importance in all traffic carried on by the Indus. If the port for Scinde is made at Kurrachee, two tides will take the *doondies* up from the harbour to Garrah, and they are capable of carrying from 70 to 100 candies of merchandise; the land journey will then be from Garrah to Jurruck, 50 miles, over an excellent road, which, with but little labour, may be made practicable for carts.

This line of route is out of the influence of the inundation, or nearly so.

* In proceeding from Garrah to Jurruck, I made three marches through a most interesting country, but have unfortunately mislaid the journal containing the account of it. The road was excellent. Two rivers were crossed—one, the Rhood, a very large one, evidently a branch of the Indus. The edge of an extensive lake was followed for several miles, and a ruined Hindoo temple of great age, containing a subterranean chamber of curious construction, was met with. The only difficult part of the road was found about seven miles from Jurruck, where there was a difficult nullah and rocky ridge to cross.

The advantages of that *via* Schewan are also great indeed for the merchant, I think superior to the one just mentioned; because by reaching Schewan during four or five months of the year, the water communication *via* the Arrul to Larkhana, can be taken advantage of.

The average time which boats take in being tracked up the river is from—

Gorabarree to Tattah, ...	8 or 10 days — tide assists for about 25 miles above Gorabarree.
Hydrabad, ...	8 or 10 do.
Schewan, ...	14 or 15 do. — say 37 days from the sea to Schewan.
By Kurrachee to Schewan, 146 miles, it will take	12 do.
By Kurrachee to Garrah, ...	2 do.
Garrah to Jurruck, ...	3 do.
Jurruck to Schewan, ...	17 do.

Which gives the following:—

From the Sea.	
Tattah to Schewan, say, ...	30 do.
Ditto *via* Garrah and Jurruck, say, . . .	16 do.
Ditto Kurrachee by land, say, ...	12 do.
The hire of a camel from Garrah to Jurruck is Rs. 4.	
From Kurrachee to Schewan, ...	„ 7-8 as.,

which it seems will be reduced, as the scarcity of camels at Kurrachee is stated to be the cause of so high a nerick (rate).

I think from this comparison that the Jurruck route *via* Garrah and the creek to Kurrachee is the best, and that Jurruck itself is the most eligible spot for a force to be stationed at. One forced march will take a detachment to Hydrabad from Jurruck, and three forced marches from Kurrachee to the latter place.

Troops can be brought from India direct to Jurruck, either from Cutch *via* Luckput, Bhoor, Meerpoor, and Bulrey, or by Juggee, Shahbunder, and Moogerbhee.

From Mandavie or Jukkow to Kurrachee, or to Gorabarree, and from *Jooria* Bunder, in Kattiawar, to any of the ports in Scinde. This will be a matter of consideration in relieving the troops when necessary.

I do not think that I have any further remarks to offer respecting Jurruck.

February 15th.—Received orders to proceed by sea to India,—hired boats, only two small ones of 12 karars each being procurable, paid 20 rupees to Tattah. Left Jurruck at 8 A.M., reached a landing-place below Tattah (2 miles) by sunset.

16th.—Hired two fresh boats at 20 and 13 rupees each for Gorabarree, left at daylight, dropped down the river to a small temporary village 34 miles.

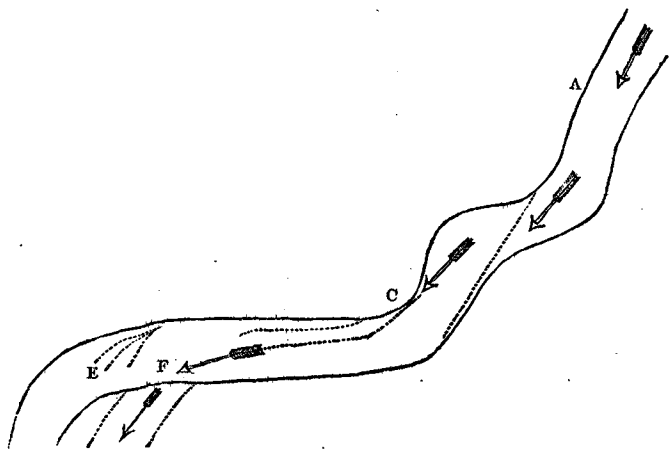
17th.—Unmoored at 3 A.M., and arrived at Gorabarree at 8 A.M., distance 28 miles, tide favourable.

18th.—The town of Gorabarree is distant from the branch of the

river on which I am now, six miles. This branch is called the Wunnyaneh or Wunniany,—that on which the town is, the Hujamree. I passed the branch of the Indus which led down to the town; it was *blocked up* and barely knee-deep; my boats could not get into it; and this turn in the river has been of some annoyance to the boatmen from the coast who went to the Hujamree, and could proceed no further. The present outlet is wide and easy; beacons have been erected at the mouth of the river.

19*th*.—Hired a *nowrie* of 40 kharans to proceed to Cutch, paid 81 rupees. This is a singular kind of vessel; it draws but 4½ feet water, although of 135 candies, and is consequently well adapted for river navigation; this boat was thirty years old, and I had some doubt of its safety, as it was quite rotten. However, there were only two others which I could have got; but as Sir John Keane's baggage had arrived before me at the bunder, I conceived it but fair to give him the two first boats, which I sent to the conductor, taking the third. We started with the tide and came at once out to sea, sounding, as we went, in one and a half, two, three, and eventually in five fathoms, when we steered S.E., and reached Mandavie on the 22d.

The branch by which I came down has been in existence two years, but this season only been safely practicable. I inquired as to the manner in which the river had changed its course—whether suddenly or otherwise: it seems that the change was gradual in this instance, although not always so, and that no lives were lost. The inhabitants of the Delta appear to be aware of the probable period of change in the



course of the river, and also of the direction the new stream will take: this they judge of by the decrease of water in the old channels; and it

stands to reason that if the former are on the right bank the new channel will take the left: this I observed when last in Scinde, (1832.) The course of the river changing as the banks right or left decrease: thus at the point A the force of the current acting or destroying the bank then forms the bank; this turns the stream to side B, which, undergoing a similar change, forces the current to C, and the same effect being consequently produced at E, the current is thrown off to F, and the branch E gradually closes up, whilst a new channel will, in all probability, be forced at or near E: it is thus with the Wunmanee and Hujamree; a few years hence the river may return to the old course, or a new channel be formed, all of which uncertainties I conceive turn in favour of Kurrachee being made the chief post of Scinde, where no changes, or very trifling ones, occur.

Memoranda respecting the Existence of Copper in the District of Lus, near Beyla. By Captain E. P. Del' Hoste.

During my absence on sick certificate, Captain Boyd, who acted for me as Assistant-Quartermaster-General, sent a guide to survey the road from hence to Haga Jamote near Sha Bullaul, and desired him to make inquiries respecting the lead and antimony said to be found in that vicinity.

The guide performed his duty well, and brought back specimens of both metals, which have been sent to Dr Heddle, Assay Master in the Mint, Bombay. Having returned to my appointment, it became my duty to protract the route surveyed; and on questioning the guide respecting the nature of the country, he informed me that he had heard it mentioned that copper was abundant (and silver and gold doubtful.) Mines formerly worked by the Kaffirs, who these Kaffirs were I could not discover; but, on inquiring respecting the copper, a most intelligent native, named Sookeramdass (brother to Naomull,) informed me that the report was quite correct, and that a Banian of Kurrachee and his son had brought copper from Beyla, or near it, and sold it to advantage. The Banian himself was dead, but his son was living at Kurrachee, and brought to me. His statement is as follows:—

"Twenty years ago, my father (named Phuttoo) and myself (named Kutto) having dealings at Sonmeanee, were informed that near Beyla there was a hill where copper (*tomba*) was procurable in abundance. We went within four koss of this hill, and got some Beloochees to give us about three maunds of the muttee (earth ore;) this we melted, and obtained 1½ maunds of excellent copper. We were advised to solicit permission to work the ore, from the Jam, and applied to his brother, Kessar Khan, offering to work the ore under his protection.

He at first seemed to agree with us; but an old man who was with him, named Nerro, of Shikarpore, told him if he did he would lose his country. On which Kessar Khan, and the Jam of Beyla—Ali, desired us to depart, and that if ever we were found in his country, or near the hill in question, he would have us *burned alive*. We left Beyla as expeditiously as possible, and brought away all the copper we had obtained;" which they sold at Kurrachee, making a good profit on it.

The following questions were put to the Banian, "Kutto," by me:—

How did you go to Beyla?—By Sonmeanee.

Is there any other road to Beyla?—Yes, by the Kunnaray river.

How far is Kunnaray river from the place where copper is found?—I believe about 20 koss; but I do not exactly know, never having been that road.

From whom did you get the ore from which you extracted the copper?—From a hill 12 koss S.E. of Beyla. Some Beloochees brought it to us.

Do the people then work the ore?—No, they are ignorant Mohammedans, and think of nothing but their cattle and thieving.

Is it known to many that the ore exists?—I do not know; the Jam and some of his people know it.

Of what description was the copper you brought away?—Of the very best, equal to that sold in bazaars, which comes from Velete, (Europe.)

What is the average quantity of copper which the ore yields?—It varies: some will give one-half, and others one-third; the average is a little less than one-half.

How did you extract it?—Simply by melting it with wood fire in a common mud furnace. The copper ran off like a stream of gold.

At what cost?—At that of the firewood.

What is the value of copper ore at Kurrachee?—Sixty rupees for 80 lbs., the best.

Do you know the value of 80 lbs. of copper in Bombay?—I believe about 40 or 45 Rs.

Where is it brought from?—From Velete: it is sheet copper.

What would it cost to bring 60 lbs. of copper from the place whence you had the ore?—I could, I think, bring 60 lbs. of copper to Kurrachee, and sell it with advantage, if I got three or four rupees for it, and sell it for less if worked on the spot.

Are any other metals found where the copper is procured?—I cannot say; we searched by stealth, and were afraid of being discovered; but it is said silver is found in these mountains.

Did you ever hear of a black substance like charcoal, which burns well, being found?—No, I never did; but I have said how much afraid of being found out we were.

Could you show the hill from whence you got the copper?—Certainly; I saw it plainly, and could find it out.

Is this ore abundant?—Yes, you could get any quantity; it is on a mountain.

Is lead and antimony found?—Yes, abundance of both; the latter is exported.

I have every reason to credit the account, as it is corroborated by what the people here say, who avouched the fact of the man having gone to Beyla about the copper.

Also, from the guide's statement, he went to the Kunnaray river.

EDWARD P. DEL' HOSTE.

Narrative of a Journey from Kilat to Sonmeanee via *Nal, the Barran Luk, and Ootul.* By Lieutenant G. H. ROBERTSON, 25th Regiment Bombay Native Infantry.

(*Communicated by the Author.*)

KILAT: latitude, 29° 0′ 19″ N. Height above the sea, 6240 feet. Variation of the compass, 2° 3′ 42″ E.

Before entering upon the narrative of my journey to Sonmeanee from Kilat, it may not be inappropriate to say a few words regarding this city, the capital of Beloochistan. On approaching it from the northward, the citadel (the Meeree or residence of the Meer or chief) first bursts into sight, about one and a half miles distant. Its appearance is very imposing; its height from the plain below is 191 feet, but being built on the terminating spur of a low range, its base is about fifty feet above the same level; its entrance is on its east side, and is approached by a gradual ascent up the streets after entering the town walls. It is composed of no less than sixty houses or rooms, large and small, jumbled together side by side and one above the other, intersected by innumerable narrow, dark, and dirty passages. Some of the rooms are very ancient, and betray tokens of decay; others have evidently lately been built, as they appear still unfinished. The Sheesh Muhal is the principal state room; the ceiling is inlaid with common looking-glasses of different sizes, varying from twelve to fifteen inches in length, by eight to nine in breadth; its walls are whitewashed, and ornamented with paintings of flowers: upon the whole, it is a prettier and neater place than I expected to see. It was used as a mess-room by the officers of my regiment during their occupation of the fort, while some of the rooms afforded them excellent quarters. The spot where Meerab Khan fell, at the capture of the city in November 1839, is marked by a small mud wall enclosure, near to a similar one raised where his mother's body was washed, &c., previous to interment. Close to this he was standing when he received the first of the two bullets which slew him, for it appears he had been assured

of success if he did so by those who were wise above others in unforeseen events. The view from the top of the Meeree is very good, and affords abundant materials for an excellent picture.

The Fort or City is an oblong square 600 feet by 250, having 18 bastions connected together by curtains about 20 feet high, and in good repair. On the western face, the outer wall of the Meeree, and the scarped hill on which it stands, form a portion of the defence; on which side, too, in continuation of it, and up the hill southward, is a small watch-tower and connecting wall. There are three gates: that to the north is called Mustoong, to the south Gilkhund, from the small *khund* or dip in the adjacent hill, where the red clay (gil) is found, of which flat plates for cooking are made; to the east, Dildar, either from its maker or from some doorkeeper (durwan) of former days. The city is 6240 feet above the level of the ocean, 922 above Mustoong, and 990 above Kwetta, and contains 2000 houses, 500 of which are now vacant. It has three bazaars: the one near the Mustoong gate, and called after it, has 60 bunias' shops, 20 of them deserted; the Dildar gate bazaar has 30 bunias' shops open out of 45; and the Koondokhana and Gilkhund gate bazaar has six shops open out of 26. Besides these Hindoo shops in the bazaars are the following—11 of goldsmiths, 10 of tailors, 6 of carpenters, 10 of workers in leather, 3 of blacksmiths, (and 7 outside.) The houses are shabby, crowded, and ill built, and the streets narrow and dirty, and redolent of unsavoury smells. There are 14 musjids—the principal one called Musjid Jamee —and 10 wells within the walls, and 2 wells outside,—one near the Mustoong, and the other the Dildar, gate. The residents in the fort are the Khanuzads (household slaves) of the chief, the Hindoos, and a few of the Dehwar tribe.

The suburbs are extensive, and on the south side of the Fort termed Babee Khel; the second, on the west and north-west, called Pus-i-Shuhur (the rear city.) The former contains 500 houses, whose distribution is as follows:—40 of blacksmiths (their residences, not shops), of which 30 are inhabited and 10 deserted; 40 of shekha (makers of sandals), 15 inhabited, 25 vacant; 20 of the Aleezy (a class of the Dehwar tribe), of which 5 are occupied; 60 of the Kumandaran (bowmen, who fourteen generations back came from Sheeraz, and obtained their present designation from Mohubut Khan of Kilat on account of their skill in archery)—they occupy only 20 of their houses. The remainder of the houses belong to the Babees, but, with the exception of 20, they are all deserted. The Babee tribe, from whom this suburb is named, is divided into four, denominated Oomur Khel, Hajee Khel, Choor Khel, and Gunga Khel. Their chief men are Fyz Mohammed and Sibgha Toolla, and the chief of the Kumandaran, Mohammed Allim.

The Pus-i-Shuhur has 3 wells and 300 houses; 20 belong to Hafizanee Brahooees, of which 10 are inhabited; 10 to Baboor Patans, of which 5 are inhabited. The rest belong to Ghiljy and other Patans,

and are all empty but 20. The head men of the suburb are Abdool Jubbur and Ruhmut Oolla.

Almost all the houses noted as now vacant were inhabited in Meerab Khan's time. At the storm and plunder of the city by the British, many individuals were reduced to a pitiable state of wretchedness and poverty, from which they will probably never recover. On the 1st January 1840 a lakh of rupees arrived at Kilat, (sent, I imagine, by our government, with its usual generosity,) and, with the exception of Rs. 9000, reserved for himself by Shah Niwaz Khan, was distributed in loans to the Mussulman and Hindoo merchants. This measure ought to have materially revived the trade of the city; but I do not know what its effects have been.*

The Dehwars form an important part of the Kilat community, and call for some notice; they are chiefly cultivators. The tribe consists of five classes, which are subdivided into six each :—

Classification of the Dehwar Tribe.

I. Sewazy.	II. Alleezy.	III. Mogulzy.	IV. Tolonteezy.	V. Dodukkaneezy.
1. Restok.	1. Tingbzy.	1. Kundhareezy.	1. Bajezy.	1. Peer-i-Punjgoor.
2. Palwazy.	2. Chugozy.	2. Palawanzy.	2. Kundhareezy.	2. Soomaeelzy.
3. Huzunzy.	3. Moreshkazy	3. Bourozy.	3. Ghunghozarzy.	3. Tuttoozy.
4. Harazy.	4. Mungarzy.	4. Sultozy.	4. Aghazy.	4. Kabooleezy.
5. Tekurzy.	5. Moosazy.	5. Buddozy.	5. Mundouzy.	5. Futteeanzy.
6. Bourazy.	6. Hussunzy.	6. Rujjubzy.	6. Yussoofzy.	6. Abdool Kurreemzy.
Res Shuffee Mohammed.	*Res Ruhmut Oollah.*	*Res Oomed Allee.*	*Res Kadurdad.*	*Res Mohammed Allee.*
Meer-ab Oosman.	Meer-ab Poollee.	Meer-ab Abdool Kadur.	Meer-ab Hydur Khan.	Meer-ab Noor Mohammed.

Each grand division has a head man, styled Rès—that of the Dodukkaneezy, Mohammed Allee, being the chief of the whole tribe. There is also another person, called the Meer-ab, whose duty it is to apportion to the different fields of his own class their share of water.

* When Nusseer Khan returned to Kilat, and Shah Niwaz Khan was ousted, all the merchants were assembled, and the money taken from them; they complained that, as they had received it from the English, the English would claim it from them also. It was accordingly arranged that they should take the money to Lieutenant Loveday, who was then in the young chief's power, and get his receipts for the amount; this was done, and the money immediately taken possession of by the Khan's people! On first receiving the loan, the merchants bought up camels at Beyla, as it was said they were selling at 200 Company's Rupees each at Kandahar. In this speculation a great loss was experienced, the camels were not sold and many died; the loss altogether has been tremendous.—(March 1842.)

The locality of the Dehwars is a semicircle of about two miles radius, from the north to the south south-east, Kilat being the centre. Their houses amount to 300, each having on an average from two to five *male adults*, so that probably the number of the men may be estimated at 1000. They supply the Khan with fifty horsemen, (formerly only thirty,) who are annually changed; while with the Khan, he feeds them and their horses, and finds them in horse shoes, and when they are despatched anywhere he gives them provisions for the road; the person to whom they are sent supplies them while they are with him, and with provisions for their return journey. Their duty is simply that of messengers (Kasids); they accompany the Khan in his journeys, but do not mount guard—this latter duty being performed by the Langou tribe, who dwell in the valley of Moonguchur, between Khilat and Mustoong, but only when the Khan is travelling; for, as far as I can understand, neither in the city or Meeree is a sentry at any time placed, except perhaps during a period of actual warfare.

No manufactures can be said to exist at Kilat except the very rough agricultural instruments, metal ornaments of women, shoes and sandals, for which the leather is brought from Shikarpoor. The women of the different households embroider their wearing apparel in a very beautiful manner, unsurpassed in any other place. Fire-arms and swords are brought from Khorassan; the former are also brought in great numbers from Kabool, where they are well made. The black shields (Baftu) are procured from Lahore and Umbursur, the yellow ones from Mandavie, and a few of inferior description from Bombay.

Around Kilat, on its north-eastern, eastern, and south-eastern face, there are 140 gardens, but only one belongs to the Khan. They, as well as the fields, are well supplied with water from a splendid spring about a mile to the east of the town, which issues from some low hills, and is divided into 4½ shares, which run in canals, called respectively Joee Booneekoo, Joee Meeanjo, Joee Goolaman, Joee Bund, or Restok, and Joee Punjoom, the last being the half share. Each Joee is calculated to supply a certain number of runs, of a day and a night each, termed a showanee, and each showanee is divided into eight pas, (a run of three hours.) Joee Punjoom and bund belong to the Surkar out of which a certain number of showanees and pases are given in enam to certain individuals. Joee Goolaman runs 24 showanees, which are shared between the Surkar and the Mogulzy; the remaining two, Booneekoo and Meeanjo, run 17 showanees, of which the Sewazy, Alleezy, Tolonteezy, and Dodukaneezy, each enjoy three; of the five remaining, the four Res of these classes have one each, and the four Meer-abs one among them. The Res' share is so great because they have to furnish the Surkar with grass, boossa, wood, kasids, &c., when required. The shares mentioned above as alienated in *eenam* by the Surkar, are these; of Joee Punjoom, three showanees are held by Taj Beebee Syud, one by Res Taj Mohammed, one by Akhoond Mohammed

Siddeek, Sooltan Mohammed Allee,* and Moola ———, between them; of Joee Goolaman, two and a half showanees by the three last mentioned persons, one by Surdar Mohammed Khan Kumburanee, half to Dilshad Khan Kumburanee, one by Res Oomed Allee Mogulzy, one by the Kandareezy Dehwars, one pas by a Fukeer, and one pas by the individual who beats the drum once a year for 15 days or so, to collect the people to clear out the spring and put it in order, &c.

There are also numerous karez, (aqueducts,) but at some distance from the city. I refrain from entering into particulars regarding the number of their showanees and their distribution, lest I should prove tiresome.

The produce of the fields is principally wheat; a small quantity of barley is grown. Jowarree, when sown, yields only fodder, the climate being unsuited to it. Only one crop is taken from the ground yearly. The gardens furnish a variety of fruit, such as apples, pears, grapes, apricots, mulberries, prunes, &c.

The burial place of the Khans of Kilat is not very far from the head of the spring; it is a small enclosure containing a few tombs.

I shall conclude this short description of Kilat with an account of the principal event which took place during my sojourn there from the 22d September to the 9th October. On the 26th of September, Brigadier England, commanding the Scinde force, and Major Outram, political agent, and several other officers, and Nusseer Khan, the young chief, now recognised as such, arrived from Kwettah, and on the following morning a royal salute was fired "in honour of the auspicious event of the Meer's taking possession of the place"—so said the field orders. His flag, a tricolour, (red, green, and yellow, in triangular pieces put together, the red next to the staff,) was hoisted at the highest part of the Meeree. On the 6th of October was the ceremony of the Installation. At four o'clock in the afternoon we all went to the Meeree, and were received by the young Khan in the Sheesh Muhal, which still exhibits unfilled up, the cannon shot holes made by the British guns two years ago. The Khan, and his uncle, Azim Khan, (a disreputable and disliked old debauchee,) and the English were seated on chairs, the rest of the company standing. After a few minutes the dress of ceremony was produced, and the Khan enrobed Major Outram and the Brigadier assisting. As soon as he was arrayed, a salute was fired by his guns—and very well done too, considering that only two, or at the most three, guns were served. He has only five or six, and they are lying on a small open space on the left before entering the Meeree gate. They are very old, and very honey-combed—of Spanish or Portuguese manufacture: on one is cut the word "Mendoza," and the dates are fifteen hundred and—something illegible. They are mounted on rough wooden wheels; the vents are extremely large, and I thought them altogether a

* At one time Sooltan Mohammed Allee possessed 500 showanees of water in various parts of Belooch-i-stan; but from extravagance became so impoverished as to be obliged to sell all, and now resides in obscurity at Kunda in Kutchee.

most useless part of ordnance, and that they would be dangerous only to those who ventured to use them.

When the robing was over, a bag of rupees was waved round the Khan's head three times, and Major Outram called out, "Moobaruk Khan!" and shook hands with him; we did the same, and I do not think I ever received a heartier shake from a native. I was somewhat disappointed in the Khan's appearance; his countenance was not so intelligent as I expected to find it, but this may be accounted for from the state of great trepidation in which he evidently was. We now went down from the Meeree, and mounting our horses, accompanied the Khan while he took a short circuit to show himself to his loving subjects. We merely went down the narrow street leading to the Dildar Gate, and out to an open space on the east of the fort, where the 25th Regiment had been pitched. Here there was an attempt at an exhibition of horsemanship, but nothing of any consequence; the only thing mentionable was the riding at speed, and scattering three small pieces of wood piled together, by discharging a matchlock at them while passing them. When the Khan proceeded on to the Mustoong Gate, we left him there and returned to our tents.

At night, after feasting sumptuously with Colonel Stacy, where the health and prosperity of his *son*, the young Khan, were drunk with due honours, according to the English fashion, we proceeded to the stables at the foot of the Meeree: there we found the chief, and were entertained with national dances. The number performed while I remained was three; the first was called the Jhalawan Chap, the next the Afghanee Chap—the performers being all Mussulmans, the third the Lutook Bazee, by Hindoos and Mussulmans, but chiefly the former. They formed a large circle round a blazing fire, and danced to the music of drums and trumpets, or horns. The dances were extremely graceful: they commenced by a slow movement, the dancers holding an end of their loongees or kummerbunds in each hand, and waving them or spinning them round to the music, which was most energetically kept up by the musicians: the time then changed to a quicker pace, the loongees were abandoned, and the hands struck together to the time: occasionally, and particularly towards the close, the time was very rapid, and the performers entered with spirit into it. The two first dances appeared to me to be much the same; the only difference I could detect was at the termination of the first, when the motion consisted of a waltz-like and very graceful series of inclinations forward of the body. The third dance was very pretty. Each performer held a couple of sticks, generally both in the right hand, and with these he beat time alternately with the neighbour on either side of him, thus forming a pleasing castanet accompaniment. We were all very much gratified; the whole scene was very wild, and our position close under the lofty Meeree extremely picturesque.

9th October 1841. *Saturday.*—I left Kilat to-day at about 1 P.M., by the road to the westward, between the Fort and the Pus-i-Shuhur, and proceeded up a valley, narrowing until I reached a heap of stones called Singundaz, distant $2\frac{3}{4}$ miles S.W., and then descended through a narrow defile to a small well, Chah-i-Shazadee (the Prince's Well.) The first part of the road is good, and the latter might be easily made passable for guns; the chief obstruction is the Singundaz. The well is not very deep, but the supply of water is sufficient for about 200 men. There is neither grass, camel forage, nor fire-wood.

CHAH-I-SHAZADEE, 5 miles 2 furlongs. Height above the sea, 6076 feet.

The charge of my person and property is entrusted to six worthies of the Khan's Dehwar body-guard: if they are a fair specimen of the whole, I should imagine his dependence is placed more on the affections of his people than the valour of these militia life-guardsmen. They are badly armed, with a sabre each, and a few shields among them, and are miserably mounted. Their sorry steeds have to bear not only the precious burden of the cavalier, but sundry items of filthy raiment, rations of flour, &c., stuffed into the ancient saddle-bags, over which is spread a well-worn posteen, (a garment of leather dressed with the fur on,) by such of the party as possess so valuable an article of comfort. I need hardly add that any motion beyond a very slow amble is not to be expected.

10th October.—Road good the whole way, occasionally over slight undulations, through a broad valley, called for the first five miles Dusht-i-Buddoo, and afterwards, for about $4\frac{1}{2}$ miles, Dusht-i-Tik, when the Dusht-i-Goran commences. Buddoo is said to be the name of a bird, Tik of a white earth or stone visible on the adjacent hills, and Gor of an animal, the wild ass, which once abounded in this valley. We crossed the Rod-i-Khanee (Khan's river) frequently; its source is near my last ground; in it, at two places, ($2\frac{3}{4}$ and $5\frac{3}{4}$ miles from Shazadee,) is a small pool or well of indifferent water. This valley is bounded on the north by the Kallagan Hills, on the west by a continuous range of mountains of various names—for instance, Marap, Isbodee, Muzardan, Surjaf, and Istrab; on the south, by small low hillocks, called Pungoo and Sumboo; on the east, by slight swellings, not deserving the name of hills. Its length is about six miles, and breadth ten; but if the whole space up to the Syud Allee range, eastward, be included, the breadth will be about twenty miles. It is subdivided by imaginary lines into several portions, each distinguished by a name, but it will be sufficient if I mention in general terms its apportionment. The Rod-i-Khanee passes through it, and after flowing westward for some miles, turns abruptly north to the Shereen-ab valley. That portion lying above the river is occupied by the Zeearuttee tribe, who have about one hundred houses scattered over it; they cultivate it when there is a supply of rain, and give one-sixth

DUSHT-I-GORAN, 10 miles $2\frac{1}{4}$ furlongs. Height above the sea, 5752 feet.

of the produce to the Zugr Menguls of Nooshkee, who claim the land as having been given them in *eenam* some generations back. The southern portion has a few hamlets along the river bank, viz., Choupankooshta, ten houses, now uninhabited from the drought; Kooddee-i-Gool Mohammed, two houses, one well; Kooddee-i-Salwee, two houses, uninhabited, one well; Kooddee-i-Dhaee, five houses, uninhabited, one karez (aqueduct), occasionally dry when there is no rain, two wells; and lower down on the same bank, Hubbee Boolla, ten houses, inhabited, one well. From the cultivators of this portion the Haroonee tribe take one-sixth of the produce, but they have no right to it.

I am pitched near the Kooddee-i-Gool Mohammed; the well is small, and the water good, and sufficient for a party of twenty or thirty persons. Rodenjo is east of this hamlet about six or eight miles.

11*th October*. *Monday*.—The road good the whole way for the first few miles over and among the small hills of Sumboo and Pungoo, where the Soormasing river commences, being at first a small *nulla*, called Zumboo; these hills end at about six miles, and there we found a pool of very unpalatable water: thence the road is level to Soormasing, over what is called the Soormasing Sur Jungul.

GUNDAGEN, 14 miles 3 furlongs. Height above the sea, 5470 feet.

Soormasing is eleven miles from Dusht-i-Goran; the fragments of rock about this spot are very singular—they are extremely hard, jet black, and shining, and contain, I think, a large quantity of iron, although I was surprised to find the pieces I took up so much lighter than I expected; this, however, is no proof of the absence of iron, for Captain C. W. Grant, of the Bombay Engineers, mentions in his "Memoir on the Geology of Kutch," that of the two descriptions of iron ore found in that province, that extracted near the town of Doodaee is of small specific gravity, and valued by the natives more than the heavier variety, from its being more easily smelted owing to its frangibility. On this point my imaginary iron ore differs considerably, being truly "as hard as iron." I thought my compass needle affected by it. This halting ground derives its name from the *dark hue* of these stones, and not "from the vast quantities of antimony (soorma) collected in the vicinity." The ruins of a Suraee are to be seen on the left bank of the river, which is now perfectly dry, so that we were obliged to come on three miles three furlongs to this place, which is worthy of its name, (Gundahanken :) it is bad altogether, nothing procurable, very little water, and that in most of the holes in the river bed foul from long disuse. After ascending the river bank the road from Soormasing is excellent, over a level plain.

There are said to be some copper mines a little southward of Soorab, and on making inquiries about them at Kilat, two men, residents of Rodenjo, were named as being acquainted with their locality. I sent for them, and they joined me yesterday at Dusht-i-Goran, denying all knowledge of the matter. I tried them in many ways, and promised them a handsome reward if they would take me to the spot: nothing

would do—they either could not or would not give me any information, declaring they had never seen the mines, and had only heard of there being such things near Soorab. I was obliged to let one of them, Allum Khan, return to his village; the other, Wulle Mohammed Fukeer, is still with me, but goes back during the night.

12*th and* 13*th October*.—Road undulating down the valley of Soorab; on the left lay a range of lofty mountains in continuation of those of Syud Allee (or wild goat) viz., Feerajoojou Chunneeree (the ladder, from its steepness) Diraj Rustaree Duzeree Sheerentoh, and beyond these to the further east Munnaee, then Sehbund, and to its east Golik and Mohammed Tawah, terminating in the high bluff point of Tarukkee. On the right were Wukkabee Kulkuttee, Taphoee Teng, Chilbuggoo, forming a less continuous and lower range of hills, many of them having sharp-pointed crests.

SOORAB, 13 miles 1 furlong. Height above the sea, 5194 feet.

Soorab is towards the southern end of the valley, a wretched ruin of a place, totally deserted; it was plundered a few months ago by that worthy Gool Mohammed the Darogah. Its inhabitants were none but Hindoos, the chief of whom is Gooloo. Three springs of fine water flow from the Tarukkee hills, and supply several villages, of which the northernmost is Hajeeka, thirty houses and two gardens; near to it, Janullo, an aqueduct, ten houses, inhabited by some of the Oomur Haroonee tribe; and Meerance, one garden and eight houses occupied by Nubbee Bukhs and Mohammed Soomallee. Below Hajeeka is Goorgoot, belonging to Khan Mohammed, chief of the Haroonee, it has four gardens, fifteen houses. Nearest to Soorab are the two Rodenees, belonging to Khyr Mohammed, chief of Rodenee Brahooees; he lives here. I rode over to see these two villages, and found them in ruins; they have fifty houses, of which thirty-five are occupied. Half a mile below Soorab is Soork, two gardens belonging to Shuffee Mohammed, (of Khyra near Giddur,) twenty houses, of which ten are deserted; it is held by several members of the Khanazad.

About a couple of miles from Soorab, on the Baghwana road, are Niggar and Kukwee, the former belonging to Surdar Esa Khan Mengul, and Surdar Rehim Khan, son of Wullee Mohammed, chief of the Menguls, slain at the storm of Kilat; four showanees of the water were enjoyed by the late Bebee Satee, mother of Mehrab Khan, and now by her son Azim Khan. It contains thirty houses, fifteen of which are deserted, and has nine gardens. Kukwee has twenty houses, five of them vacant, and seven gardens, and is held half by the Niggar people, and half by Akhoond Mohammed Siddeekh. Dun is about three miles south of Soorab, and is enjoyed by Surdars Esa Khan, Rehim Khan, and Taj Mohammed; it has five gardens, two bunias' shops, and twenty houses, all inhabited. Near to Dun is a deserted village, with an aqueduct called Gezhdughan.

It is much to be regretted there is no rain or other plentiful supply of water in this country, for since I left Kilat I have passed over

most excellent land, only requiring water to produce superb crops. The inhabitants maintain that rain has ceased since the British occupation of the country; but some years before we came here there was a cessation of the usual showers.

I have again endeavoured to get some information regarding the copper mine at Moulee. I was told of another man at this place who is one of the few remaining alive who know anything about it; he formerly resided at Dun, and Moolla Izzut of Rodenjo used to put up at his house when he made his trips to the mine. A handsome reward in money and clothes was promised to him if he would take me there, but without avail—he denied all knowledge of the matter, farther than that the Moolla used to stay with him in his periodical visits to and from the mine, but that he had never accompanied him. This man, doubtless, knows more than he chooses to admit, and it is a pity he will not show me the place, as an examination of it might lead to beneficial results to the people themselves. The Moolla's son, Ahmud Allee, says the produce of the metal was twenty-five per cent. of the ore.

14*th October.* *Thursday.*—A fatiguingly long and hot march: we left Soorab at 9 A.M., and reached this village at about half-past 5 P.M. The road is very good, and over excellent soil the whole way. Immediately on leaving the valley of Soorab, three miles below the village, our road lay through a defile called Tung-i-Deck, on the left being the remarkable-looking hill Deck, and on the right a range of low detached hills with jagged points. The Soormasing river passes through this defile, which is of no great length. The river here becomes of considerable breadth, and when we recrossed it at eleven and a half miles from Soorab, it was upwards of half a mile broad, and perfectly dry. A mile after crossing it, the usual Kafila road strikes off to the left towards a large tree, visible a long way; this leads to a halting place on the river bank, where there is water, and is said to make a shorter stage than this village.

GIDDUR, 17 miles 5 furlongs. Height above the sea, 4780 feet.

Giddur is composed of two villages, one belonging to the Surkar, situated on a low rocky ridge, and containing fifty houses, of which thirty are habitable, but not inhabited, except in the very cold weather, as these people prefer their goedans, (black *kumlee* tents,) which are pitched outside in the fields. The other village is about a quarter of a mile to the south-west, at the base of a detached piece of the ridge; it is surrounded by a wall, and has a small tower on the top of the rock, which is about 100 feet high. There are forty houses in it and two Hindoo shops, and it belongs to Futtih Khan, son of Durshad Khan Rodenee. There are also three gardens belonging to Futtih Khan and his two half brothers, Moobaruk Khan and Koota.

There is an excellent stream of water here, which is rated at twenty-four showanees, and shared as follows: twelve to Futtih Khan, because he made a dam across the river, five to the Surkar, one to Bhace Khan

Soomalaree, and six to Misree Khan, because his brother Gwaram Khan was murdered by Allee Mohammed Kullundraree.

The valley which lies on the west of the town is extensive, and called Dusht-i-Mut (the plain of abundance) on account of the excellent crops it yields. Quantities of grain are taken northward from this; but strange to say, I can only obtain eight seers of barley for a rupee, while at Kilat nine and a half were to be had, most probably the produce of this very place.

Shuhur-i-Khyra is 2½ miles north-east of Giddur; it has a small fort with one door on the east side. In the fort are seven houses, and outside nine. The inhabitants amount to about thirty male adults, who cultivate the land when there is a sufficiency of rain; the head man is Shuffee Mohammed, son of Khyra.

The climate here is altogether hotter than at Kilat; snow rarely falls in the winter, and when it does, it does not lie in the low country, the tops of the hills merely being covered.

On arriving here, I was surprised to find my *kit* deposited in the Musjid, which had been cleaned out for me. This shows that in this purely Mohammedan country such objections on this score are not held as some of our countrymen in India would have us believe, when pleading most piteously on behalf of the "poor oppressed" natives there.

The road to Punjgoor branches off from here south-west across the Dusht-i-Mut, and passes between the Koochenee and Kulgullee hills up the bed of the Kulgullee river, which is described as being very narrow in some places: the distance of Punjgoor is eleven days' journey for laden camels. (See Appendix.) Dates of a very fine description are brought from it, and supply all this and the upper country. The ground at this village is strewed with the stones of the dates, upon which the people seem to feast prodigiously.

15*th October. Friday.*—Early this morning my moonshee, Mohammed Bhakur, came with much delight to tell me he had fallen in with a man who knew something about the copper mine, although he had not actually seen it; he said his field was not far from a spot in the hill at Moulee, and he could point out where a great quantity of green-looking stone was to be found, similar to what Moolla Izzut of Rodenjo used to carry away in former days; he had come to the bazaar to-day for seed. After conversing with the man, he said that if I would promise him a rupee he would go and fetch a specimen of the stone he had described; the distance was great, but he would be back early to-morrow morning. I determined, if his specimen proved satisfactory, to take a trip to the spot. To my surprise, he made his appearance again this afternoon, but as he bore no traces of fatigue, it was very evident he had not been many yards from this village the whole day; he brought with him a parcel of common stones, most probably picked up in the neighbouring nulla. I could not help laughing heartily at the fellow's impudence, and the admirable seriousness of countenance he

maintained; and although he had not performed his part of the agreement, I thought it advisable to give him half the stipulated reward, as it would show there was no unwillingness with me to remunerate for any odd jobs that might be done for me.

16*th October*. *Saturday*. — Road generally good. At seven furlongs from Giddur we crossed the Soormasing river, the ground on this side being much broken and cut up by *nullahs*; the road then skirted a low range (the river being on the right for a short distance) into a small plain, where it became very good. At five and a quarter miles we passed on our left a black hill (Mortkoh), the beginning of the Dusht-i-Drooggee, a plain of small extent, covered with the stunted roots of the grass called Droog; to our left lay the high road. We left five miles the other side of Giddur the day before yesterday; we did not come into it until we reached a small river at nine and a quarter miles, the banks of which are very steep, but I am told it is easy to cross where the road passes it higher up. This river flows from the north-east into that of Soormasing, and the junction is about three miles lower down. We are encamped at a bend in the Soormasing river, which has a flow of excellent water in it; on the right bank is a mass of hills, round which the river sweeps, of very curious appearance, showing the strata about perpendicular; they are called Purra-i-Shadad, and appeared to me composed of basalt and chalcedony. I climbed up the highest and found the ascent difficult, that portion of the rock which I imagine to be basalt being very brittle, and readily falling in flakes from beneath the tread. From the top, about 100 feet high, I was able to see a considerable extent of country to the west; it seemed a sea of small swelling hills running up to the Bund Range. There is plenty of tamarisk for camels, and fire-wood, and grass of a coarse description was brought by my grass-cutter for my horse; there is plenty in the adjacent hills.

ROSHUN-AB, 12 miles 2 furlongs. Height above the sea, 4461 feet.

Six of Jumsheer Khan's men, chief of the Shadadzy, have joined me and are to accompany me to Nal. As we were coming to the halting ground, eight or ten men with a few donkeys passed us, and I was amused to find on inquiry they were the *Lushkur* of Surdar Bhaee Khan Soomalaree; shortly afterwards another party of Brahooees passed in hot pursuit of the redoubtable army, who it appears had coolly helped themselves to a sheep belonging to the others.

17*th October*. *Sunday*.—To-day's road would require some repair for artillery; at the commencement, for the first mile and a half, the *nullahs* should be smoothed down, and after that, for a short distance, the tamarisk jungle should be cleared. The same operations are required here and there to a small extent. At one mile three furlongs we passed the halting ground of Allut, occasionally cultivated by the Shadadzy tribe of Mohammed Sunnees, who have ten geedans in this quarter. Our road lay along the left bank of the Soormasing river for six and a half

KHULBOOT, 10 miles 7 furlongs. Height above the sea, 4105 feet.

miles, and down its bed for about a mile and a half: we then crossed over some small swellings, causing a bend in the river, and again entering it at nine miles and three-quarters, we proceeded to our ground on the right bank, close to the foot of a very remarkable rock about 100 feet in height, called Moocheereekhul. Guns should continue in the river bed the whole way to this after entering it the first time. There is camel forage and coarse grass here, and plenty of water, but it is not very good, being saltish, so that it is fortunate for me that my servants have brought some from Roshun-ab.

Only three of Jumsheer Khan's people have come on; they all claimed something from me, which I refused to give. I told them I did not require them, and they might return home if they liked; upon this they all remained behind: subsequently, three of them overtook me, perhaps believing that they may safely trust to my giving them some remuneration on the termination of that portion of the journey they are to take with me.

18*th October*. *Monday*.—Our road the whole way lay either in the river bed or across short angles in the bank, caused by bends in its course. On both sides we were confined by ranges of hills; those on the left, Sinjdee and Seeroo, and the lower hills of Subsrung, were of goodly height; but those on the right were broken insignificant masses flanked by the Hoon range. We wound about very much. Without a great deal of clearing away of the stones, this would be a difficult march for artillery, particularly on this side of a small pass over one of the bends called Nihing, about seven miles and a half from Khulboot.

CHOOTOK, 11 miles. Height above the sea, 3937 feet.

There is some camel foliage here, and grass; the water is not very good—there was plenty of it in several places on the way.

My observation has been particularly attracted to-day to the variety of colours in the hills, particularly light green (hypersthene greenstone?) I should much like to wander about this spot for at least a week—I am sure the result would be satisfactory; there must be copper in the neighbourhood.

19*th October*. *Tuesday*.—We left the Soormasing river at three-quarters of a mile from the last ground, and after crossing a bend at two miles, did not come to it again until we reached its left bank at this halting place, which is upwards of a mile from the said bank, being in the bed of the river, which is here at least a mile broad. At about two miles from Chootok the road divides into two, the one to the right going off to Gresha. After leaving the Soormasing river we proceeded up a *nulla* and across a small open space to the Loch river, where there is good water; we crossed this river to a spot used as an encamping ground when it suits the convenience of travellers, and then proceeded in a *nulla* uphill for the first mile, with steep abrupt banks, and then downhill in another *nulla* for three miles; many parts would require clearing for guns, being rough and winding.

TEGH-AB, 11 miles 2 furlongs. Height above the sea, 3316 feet.

The water here is excellent; camel forage and firewood are at hand, and coarse grass is obtainable from the neighbouring hills. The river extends over a considerable space of the hollow we are now in, among the hills of which those to the south are a large mass of great height, and visible from a long distance; they are called Shashan. The halting ground of Khoorma-i-stan lies to the south-east, the village of Nal to the east, and the valley of Gresha about south-west.

20th October. Wednesday.—For the first three miles and a half our road lay in the river bed, which here receives several tributary streams, but is now nearly dry. We then entered the Shaband Khund, a pass a mile long; it is rough and narrow, but is steep for a furlong only; it led us into the plain in which Nal stands. In proceeding to the coast, guns should avoid Nal, and go direct from Tegh-ab to Khoorma-i-stan, distant six miles.

Shortly after my arrival the uncles of the chief called on me and were very civil. I was extremely sorry to learn that the chief himself was absent, having proceeded in the direction of Kilat to see the Khan. In the afternoon he returned, and sent me a message to say he was tired from his journey, and as I must be so also from mine, he would not come to see me to-day, but would do so to-morrow. In reply, I begged the messenger to assure him how delighted I was at his return, &c. In the evening a present was brought me of a couple of sheep, two donkey-loads of kurbee, and some firewood. From the little I have seen of the Brahooee people as yet, I must say I like them very much; they are very kind, and civil and quiet, and very good-tempered.

21st to 24th October.—Nal is a very insignificant place; it has a contemptible fort, about 100 yards long by 60 broad, of no strength whatever. The entrance is on the east side; it contains fifteen houses, three of which have balakhanas (upper rooms.) Surdar Fukeer Mohammed and his two uncles, Meers Ruhmut Khan and Hasil Khan, reside in it. Outside the fort, on the north, are fifteen houses, occupied by the slaves and cultivators of the Surdars. Dependent on Nal are four hamlets, inhabited by the Bunias, and called after them as follows:—Teekeea, one shop and twelve houses; Takoo, one shop and seven houses; Ooda, one shop and ten houses; and Setoo, one shop and six houses; and also a garden, lately commenced, the property of Meers Ruhmut and Hasil Khan, and their nephew Doorgosh (son of the late Kummal Khan Hummullaree).

There are two good streams of water here. One springs out of the high hill west of the fort and flows past it, the other is more northerly. The water is rated at thirty-one showanees, and distributed as follows: Seven to the chief, eight to Oomed Khan Mengul, (his right by purchase), two to Meer Hasil Khan, two to Bohur and Moorad Khan of the Bohurzy Beezunjos, three to Muzzar (Oomurraree Beezunjo), three to Rozee (Guburraree Beezunjo), one to the village Res, and five to some of the Kummal Khanzy tribe of Beezunjos. The extent of cultivation dependent on these springs is of course very limited; but when

the rains are copious the valley is very fertile, the soil being extremely good. Camel forage is procurable here in small quantities, also grass and fine kurbee. Supplies of grain, flour, &c., to a limited amount, are to be had from the Bunias, who furnish the Surdars with seed-grain for their fields, and receive the whole produce, out of which they furnish the Surdars' daily wants.

I have been twice to the spring nearest the fort. The first time I had not a thermometer with me, but the temperature of the water must have been between 95 and 100 deg. about sunrise; the second time I ascertained it to be 83 deg., the atmosphere being 70 deg. at half-past seven A.M. From this it would appear that as the day increases the warmth diminishes; and this is what the people say, from whom I also learn that in the cold weather the water is quite hot. Pottinger, in his travels in these regions, mentions the curious circumstance of the spring at Kilat becoming cold during the heat of the day.

Khoorma-i-Stan is five miles to the southward of Nal, on the south side of the Soormasing river, which here takes an easterly turn for a short distance. It has a small fort, with entrance on the east. About a mile on this side are eleven houses and a garden, having inside and about it thirty-one date trees (Khoorma). It is occupied by the Nindou Seeapad tribe of Beezunjos. The land between it and Nal is cultivated by the Muzzar Oomurraree Beezunjos, who have no village here, but live in geedans.

Fukeer Mohammed Hummullaree is the chief of the Beezunjo Brahooees. I have seen him frequently at my tent during my stay here, and have received much kindness and civility from him. He is a pleasing young man between 25 and 30 years of age, somewhat reserved, except on those occasions when he came to me unaccompanied by his uncles. He is treated with great respect by every one, and is much beloved for his very kind and generous disposition. He is Naib of Kej, and, I am told, the only governor the Beloochees of that province pay any attention to. He proceeds thither in a few days to settle affairs and collect the revenues, which are very fluctuating in amount, and depend upon the power of the ruling authorities to collect them. A considerable portion is spent in its internal management, and the rest (in camels, female slaves, and venetians) is sent to the Khan of Kilat. I should much like to visit Kej and Punjgoor, and other parts of Mukran, and the Surdar does not seem indisposed to my accompanying him. I am extremely glad I have become personally acquainted with him; for his friendship may some day prove of great value, should my wanderings ever again be among the Beezunjos of plundering reputation. His uncles, Ruhmut and Hasil, are said to be very close-fisted, and are consequently by no means liked by the people in general, who, as a body, are exceedingly hospitable and generous, and it strikes me that this willingness to distribute, on their own part, may account for their constant asking for small presents. More accomplished beggars it has never been my fate to fall in with.

My tent has been at various times surrounded by groups of men and women (the latter much less reserved and shy than those farther north) anxious to see the Feeringee, and what he is about; numbers have applied for medicine, and I have been obliged to practise extensively. One of the applicants was a man who complained of a pain in the bowels. As he had just had himself *fired* for it, I declined prescribing, and told him that now he must wait and see the effect of the treatment he had undergone. A day or two after, he died, and I got the credit of great sagacity; it was supposed I knew he was likely to die, and on that account would not give him any *daroo*, lest it should be said I had killed him! I certainly am glad I gave him nothing, for, in the state in which he was, I do not think I could have done him any good, and his death would probably have been charged on me. Hasil Khan's little girl, Noor Beebee, about a year old, has been under my hands, and I trust beneficially so; the mother has had eight or nine children, and they have all died of the same complaint, fever, when at the same age: the poor little creature is very emaciated, having had constant fever for the last two months. I at first administered to it with fear and trembling; but the fever has now been checked, and as I have left some quinine for it, I do hope the little thing will recover, although I fear for it in the hands of its nurses. The last time it was brought for me to look at before my departure, the mother sent me some very fine dates: the poor people seem very grateful.*

One day I returned the chief's numerous visits, dressed in the Belooch costume: it seemed to give great satisfaction, particularly as my adoption of their dress is considered complimentary to them. When I saw the chief subsequently, he expressed his great disapprobation of my usual costume, and wondered I should prefer the tight English Poshak to the flowing garments of the Brahooees. We had also a discussion on the subject of beards, and he could not understand why the English should disfigure their faces by not allowing them to grow, and was surprised when I told him my lengthy beard and mustachios must disappear on my mixing in civilised society. On the occasion of my calling on him, I hoped to have been admitted into the fort; but instead of this, a carpet was spread outside, and the womenkind (curious everywhere and in overy clime) crowded to the windows and entrance to see the Ungreez. No state of any kind was attempted, the poverty of the chief stood undisguised. Our conversation was on various topics, but the subject that occasioned most surprise, and the greatest questioning, was that of the English having a *woman* to reign over them, this being so contrary, in their ideas, to the dignity and importance of "the lords of the creation, whom men we call."

* I was much gratified to learn, a day or two ago, from a man who has just arrived from Nal, that Noor Beebee has perfeetly recovered.—(28th January 1842.)

25th October. *Monday.*—Road excellent, crossing the Soormasing river, 500 yards broad, at 5 miles, and encamping a short distance from it at this place, which is merely a halting ground, and derives its name, I imagine, from the exceeding productiveness of the soil, which is excellent. There is good running water here, coarse grass, and camel forage, all in abundance.

HAZAR GUNJEE, 9 miles 5½ furlongs. Height above the sea, 3192 feet.

26th October. *Tuesday.*—Road pretty good, in some places (about the second mile) the ground is broken and cut up by small *nullas*, and there is also a good deal of low tamarisk jungle. We crossed the river at 6 furlongs from last encampment, and proceeded down its left bank until 6¼ miles, when we again crossed it, and came over undulating but clear ground to the present spot in the bed of the river, the descent to which is somewhat stony, but not very difficult.

GURROKH, 8 miles 3½ furlongs. Height above the sea, 3025 feet.

Troops should encamp either on the bank above, or proceed on through the gap. At 3 miles 5 furlongs from Hazar Gunjee, we passed a curious-looking village composed of a number of mud huts excavated from the ground and covered over. At about 4 miles we were abreast of a small fort, built by Fukeer Mohammed of Nal two or three years ago: it is on the right bank, and appears a miserable place, being of single walls on a small mound. About two miles before reaching our present encampment the road from Khoorma-i-stan joins the direct one from Nal, by which we came; it is said to be very good, and runs along between the right bank of the river and the small range called Gutterou, which flanks the Shashan hills.

Firewood, and plenty of camel forage, and coarse grass; the water in the river is saltish, but in the running stream, which is conducted off for cultivation, it is very good.

The river here passes through a gap at the end of a low range of hills which have for some few miles been on our left: from Nal to this gap the valley is called Sur Nal, and from the gap southward to Guz, Cheroo Nal: the former is 24 miles long and of various breadths, the greatest being 8 miles; the latter is 12 miles in length and about the same in breadth, and is the locality of the Bohurzy, whose chiefs are the two cousins Moorad Khan and Bohur, two notorious levellers of black mail, and committers of sundry atrocities.

27th October. *Wednesday.*—The road generally very good; some of the *nullas* would require smoothing down for guns, and the Guz-khund commencing 1¼ mile from here is a little rough. At 4½ miles from Gurrokh we crossed the Soormasing river, and left it to meet it no more: at that spot called Purra, there is water, and it is occasionally made a halting place. After leaving, we continued to cross for some distance several parallel ridges of rock (basalt, I think) lying about east and west; they appeared like the *back-bones* of hills which had been covered over from their basis. At 5 miles from Guz, and continuing almost to this place,

GUZ, 15 miles 1 furlong.

we fell in with, and passed among, similar ridges somewhat more exposed, but lying north and south. In some instances the ridge was composed of two parallel rows of enormous square stones. In yesterday's march, after crossing the river just before the junction of the Nal and Khoorma-i-stan roads, similar ridges running north and south were met with.

Our present camp is on the bank of the Guz river, which flows from the east from a hill of that name, and having been joined by a stream, the Parechee, from the south, turns abruptly north, and joins the Soormassing river. Water from the river good, camel forage, firewood and grass procurable. Our position is confined among low hills.

28th October. *Thursday.*—Our road lay five miles up the bed of the Parechee river to its commencement as a mere *nulla* at a Khind, on this side of which was another *nulla* running into a river (also called Parechee) at a mile lower down. On the bank of this last we are pitched. The road is winding, and shut in the whole way by hills varying in height, and, considering the nature of the country, is not very bad, and artillery might travel it without much difficulty. In many places steep banks would require sloping; but, as their steepness proceeds from the soft nature of their material, acted upon by rapid torrents, it would be easy to cut them away. An active enemy holding this piece of the road might very easily seriously discompose a superior body marching through it.

GAEETO, 9 miles.

The water here is extremely salt; but a small quantity of good may be procured near the spring which is on the southern edge of the hill Gaeeto, and is distinguishable by a clump of rank grass. Firewood in small quantities, also camel forage and grass.

I ascended Gaeeto this afternoon; it is about 500 feet high, and is said to have been convulsed by an earthquake, of which it bears the marks very evidently: it and the greater part of the hills about here seem composed of basalt laminated; the pieces are very hard, but easily separate and shelve off under the tread; they are called by the Brahooees Taphooee, and those laminæ which are of a suitable thickness are much prized by them for *tawas* (frying-pans, ﺗﻮﺍ.) The ascent and descent of this kind of hill are very fatiguing, and sometimes even dangerous; but as yet the greatest inconvenience I have experienced is the destruction of my English shoes; the hard soles are soon cut to pieces by the Taphooee, which, as the natives say, is a great dooshmun (enemy) to leather.

I was much amused to-day with Suffur, the Brahooee Fukeer Mohammed has sent with me. He told me, in answer to the question of how many people he had slain, that they amounted to five—two of them in what I suppose may be considered fair fight, and three by waylaying them; and that he fully expected his turn in due time would come, and that he would be killed in revenge by some of the connexions of one or other of his victims. I asked him if he was not ashamed of

himself. He said, No—that his chief had given him the order, and I dare say he thought (in the words of Shakespeare) "if his cause be wrong, our obedience to the *chief* wipes the crime of it out of us; if these men died not well, it will be a black matter for the *chief*, whom to disobey were against all proportion of subjection." I then inquired what instructions he had received as to cutting my throat. He replied, "None;" that now he was of course my servant, and ready to obey my commands. I asked him if in that case he would kill the moonshee who was sitting with us on the top of a hill, if required. He said, certainly, and unsheathed his knife in an instant, by way of showing his readiness.

> "To break within the bloody house of life,
> And on the winking of authority
> To understand a law."

We were all laughing together; but he would probably, without hesitation, have committed any atrocity directed. He is much disgusted with the Khan's sowars who are with me, because they did not give him any of their *khana* last evening; he says that Brahoocs would not have treated him so shabbily, as they invariably share their meal with any one who is unprovided. The moonshee (a Kilat man) corroborated this, and remarked, that if any one acted contrary to this liberal manner, he would be thought very badly of.

29th October. Friday.—The road lay down the Parechee river, crossing a small *khund* called Jurtullee on its right bank, at $2\frac{1}{4}$ miles from Gaeeto, and is very good. At $4\frac{1}{2}$ miles the river becomes contracted to about 40 yards in width for nearly half a mile, and this part is called Parechee-kee-tung: in some places, for a short distance, the actual road is only twelve or fifteen feet broad. In the Tung are several large stones, and although some of them are not very far apart, they would be little or no impediment to artillery. After passing through the defile, guns should continue down the bed of the river for about four miles, and then turn off to the left, when another four miles will bring them to Oornatch; this, at least, is the information I have received, for I have not been able to ascertain the point by personal observation and survey. After the Tung, the kafila road, by which I came, strikes off to the left up the steep bank of the river, and continues over smooth ground for about half a mile; from this to the termination of the defile, called Sinjaroo-ka-khund or durruh, is one mile, so intersected by ridges of rock that in its present state it would be utterly impossible for artillery to be driven through it, and to put it in order much labour is requisite.

OORNATCH, 8 miles 2 furlongs. Height above the sea, 2661 feet.

30th October. Saturday.—The plain or valley of Oornatch is 9 miles broad by about 14 long; in the centre are the ruins of what was once a small fortification, destroyed during the many fights between the Menguls and Beezunjos; a short distance to its north is a Bunia's

shop, where small quantities of flour, jowarree, barley, and dates are procurable; scattered about are ten houses, in which grass, &c., are stored, for it is only occasionally in the cold weather they are inhabited, the people preferring their geedans. There is camel forage here, and kurbee can be purchased; the water is not very good, having an unpleasant taste; it is from the Oornatch river, which flows from the north-east through the valley, and joins the Parechee about ten miles below the fort, and thence retaining its own name, I am told it runs southward, and enters the Hingol river a *munzil* above its debouchure into the sea about sixty miles west of Sonmeeanee, in the province of Lus.

Cultivation depends upon the rains principally, but there are two channels which draw off the water from the river; they belong to Hybut Khan Kumburraree, who resides here, having naturalised himself among the Beezunjos, because when the Beezunjo Surdars were slain on a certain memorable occasion at Khozdar by Muhmood Khan, grandfather of the present Khan of Kilat, his father was with them, and shared their fate. He is one of the chiefs of the Mohammedzy and Keeazy tribes, who some generations back murdered some of his ancestors, and were on that account placed under the authority of his family. The other chiefs associated with him are Mohammed Khan and his two nephews, Daood Khan of Mushky, and his brother Sadut Khan, resident at Kilat, who having married the widow of the late Misree Khan of Giddur, enjoys his share of water at that village.

The Oornatch district is occupied by the Tummurraree Beezunjos; their chief is Allahdinna, who is also head of the Mohammedaree, Gubburraree, and Loodanee: the united force he can bring into the field is 300 fighting men. He is very unwell at present, and Hybut Khan, when calling on me yesterday, begged me to halt here to-day, in order to give him some medicine. This forenoon I went to see him; he is living in geedans some distance off; he is extremely venerable and pleasing in appearance, and there is a striking resemblance between him and Hybut Khan; they are both fine-looking patriarchs, with beards as white as snow. The old gentleman entered into a long and wearisome account of his ailments, which were complicated enough, and embraced a period of many years. The geedan into which I went was a very nice one, about twenty-five feet long, by nine or ten broad; it was constructed of three erect half-oval frames of wood eight or nine feet high, set up at intervals, and over them a black *kumlee*, whose web was goats' hair, and woof sheeps' wool: this reached to about four feet from the ground, and the lower space was filled up except on the entrance side, by matting. I found the heat inside very great, the sun's rays making their way in through the interstices of the coarse *kumlee*. The women in the next geedan seemed to be much amused at my appearance, for they kept up a hearty giggling while I was outside, and two or three of them came into the geedan I entered after I was in.

Besides the four tribes under Allahdinna, are the six following, the whole being under Fukeer Mohammed of Nal, as chief of all the Beezunjos: Lotanee, Chunnal, Buddoozy, Oomurraree, Seapad, and Nindowarree; their Lushkur amounts to about 400, besides those of Allahdinna.

The notorious plunderer Futtelee is staying in this neighbourhood just now; his usual locality is below the Baran Luk, west of Kanejee, but on account of the recent quarrel (not yet satisfactorily arranged) between the Beezunjos and Menguls he has come here. This man is the curse of the road and the terror of the Kafilas, and will probably some day experience the fate of that celebrated robber Nubbee Bukhsh of the Mooreh Pass, who was blown from a gun for his malpractices by Shah Niwaz Khan, and perhaps this is one of the few beneficial acts performed by that detested and tyrannical prince during his brief reign as chief of Kilat. Futtelee and another (whose name I do not know, but he is a person of no such celebrity happily) are the sons of Moolla, who, with Ruhmut, (father of Kurrum Khan residing at Bela,) and Allum Khan, (father of Allahdinna of Oornatch,) are sons of Gajee, chief of the Tummurraree. Ruhmut and Moolla (the latter still living) are the persons who joined Captain Christie and Lieutenant Pottinger at Bela in 1810.

31*st October. Sunday.*—Road good; in some places the bushes may require clearing away. Water very good, from holes in the bed of the Oornatch river. Coarse grass and camel forage procurable.

31*st October.*—This spot is close to the bank of the river after crossing it, and takes its name from a peer who lies buried here; his grave is enclosed by a small wall of stones, and covered in with leaves, so that it might be mistaken for a deserted hovel; at its entrance are hung some offerings, such as camel bells, and the tassels of Koorjees (Saddlebags.)

HUSSEN PEER PURDESEE, 6 miles. Height above the sea, 2998 feet.

There is a direct path from Gaeeto to this place across Kullagoo Hill, but it is not practicable for laden camels.

1*st to 4th November.*—The road is very good until the river of Datunnadeer at three and a half miles from last ground; the descent into the river is rough and bad, and thence until this spot below the Luk the same may be said of the road with the exception of a few parts. At one and a half miles from Hussen Peer we came to a narrow pass between the hills which bound the Oornatch valley on the east, that on the right being of a conical shape, and named Keeroo; through this defile the Oornatch river flows from Toorkubbur, and where we crossed it the banks require a little sloping and clearing of bushes. At Datunnadeer we found water, of which had we been certain, we should have made this the halting ground yesterday. The

BARAN LUK, 7 miles 4 furlongs. Height above the sea, 2780 feet.

road from Toorkubbur joined ours at a quarter of a mile from the commencement of the Baran Luk, which is at four and a half miles from Peer Hussen. At this point there are two roads, one leading direct up the Pass, and the other goes round by the right, and is a little longer, and is considered the best of the two by the Kafilas, but the jemadar of the Madras Pioneers, accompanying Captain John Leeson's detachment, marching to the coast from Kilat *via* Wud, is now at work here with his men, and tells me that, after examining both roads, he finds that the straight or eastern one will give him least trouble to repair, as he can, by a slight deviation here and there, avoid some of the worst parts. At six miles from Peer (by the western road) the two roads meet, when the descent of the Pass begins; it is gradual, until just at its termination, where the road is extremely narrow for about 150 yards, part of which is through a cleft in the rocks, and then goes down the steep southern face of the hill.

There is nothing very striking in the Luk. It is nothing more than a couple of stony water-courses, up and down a very ordinary hill, the ascent being very trifling, and the descent, though steep, only about 200 feet. I find that the foot of the hill where I now am is 218 feet below our last halting ground, and 119 feet *higher* than Oornatch; for wheeled carriages the road is certainly very difficult, but the pioneers are labouring hard to make it passable. I have ascended the highest point of the Luk. The view is extensive, but as far as the Baran hills* are concerned I saw nothing "sublime or majestic" in the scenery, and my feelings might be considered those of disappointment rather than of admiration and awe, as experienced by Lieutenant Pottinger; but of course one man cannot judge of the impressions made upon the mind of another. On the eastern side is a mass of dark hillocks, looking like an "agitated sea" of coal-ashes and cinders, suddenly fixed; on the west are higher hills of a lighter colour; the scene from the north is partially shut out, and the south alone exhibits an uninterrupted view of "rugged and stupendous mountains." There is a fissure right through one of the hills of the Luk, occasioned, I suppose, by some convulsion of Nature, to which this country has unquestionably been subjected at one time. The Luk takes its name from the Baran river, which, running hence, is said to join the Indus at Karakhu, a hunting-ground of the Umeers of Scinde, about two miles south of Kotree. I remember when marching from Kurrachee to Upper Scinde, in Dec. 1840, we encamped one day on the bank of a river of this name at a place called Buchanee.

Coarse grass is procurable here, but camel forage seems scarce, and of firewood I can see none. The water is extremely good in the river, which is here called Tullardeer.

* I have since been informed that the name of these hills is not Baran, but Hunnarturkee هنار ترکي.—(March 1842.)

5th November. *Friday.*—A very short march, but artillery would, I think, find it fatiguing; for the first four miles and a quarter it is very undulating, over and up and down *nullas* and river beds; we then came to what appeared the junction of two rivers—the ascent and descent of the banks were very great. This ground is marked by a few trees, near to which is a grave, "the mosque and cemetery," I imagine, described as being here by the Ufghan horse-dealer to Captain Harris, (*vide* "Proceedings of Bombay Geographical Society for February 1839.") Plenty of camel forage and coarse grass, and in the ravines firewood, but the water is upwards of a mile distant, close to the hills to the eastward; the supply is not abundant at present, but by scooping out a few holes sufficient for a large detachment may be obtained.

KANEJEE, 7 miles 6 furlongs.

6th November. *Saturday.*—About one hundred yards from the trees at Kanejee we descended into the bed of the river of that name, and continued in it for a mile and three quarters; at two miles and a half we entered the Aranweree river, and ascended its bed for about three furlongs; we then left it by a bad piece of road, and crossing over pretty good ground entered it again at four miles and three quarters, and continued zigzagging in it for about a mile, (it being shut in by steep cliffs on each side,) and then zigzagging up a hill, did the same down another, after first proceeding for a short distance on level ground; the last winding descent may be avoided by using a road striking off to the left, made lately by the people of the country; it joins the old road at seven miles and a quarter from Kanejee, the foot of the steep. We then proceeded along the dry bed of a river called Meeran Khooshta, till it strikes off to the left three quarters of a mile farther on, at which spot there is a hole of water. The bed of the river is occasionally used as a halting ground; it is very confined. Leaving it, we crossed a small but very rough hill, and re-entering the Meerankhooshtee river, at nine miles three furlongs, continued in its bed until we turned up its right bank, 300 yards from where we have halted. In it, at ten miles three furlongs, we passed a hole of water, called Basoon Khanee from its heat, but I did not find its temperature very high. Opposite to the point where we came up the bank, a road runs off on the other side to Gudab, which river is parallel with this one. Most of to-day's road is in narrow defiles; some parts are very pretty, particularly in the river near the Basoon Khanee, and there is abundance of jungle to please the eye. With the aid of the pioneers, this road will not put guns to much inconvenience.

SULLOU RIVER, 13 miles. Height above the sea, 2589 feet.

There is plenty of grass and tamarisk in the river, and the water is good. We are now only seventy-two feet below the level of Oornatch; the country is bare and barren, and the clumps of cactus appear to me to render the scene more desolate. On looking back northward, a wall presents itself of sterile rocky hills, each with its jagged and weather-worn crest; it seems hardly possible we can have found a way through them.

7th November.—The road, upon the whole, is excellent. At 300 yards from last ground we entered the Pinj river by a slightly stony descent, just at the point where the Sullou river joins it. At three furlongs farther, we came upon a small puddle of good water at the bend of the river, which is here shut in by lofty walls, and is very narrow, varying from twelve to twenty-five feet in breadth; it is stony, and may require some pioneering. At one mile five furlongs we came upon a fine stream of running water (in the river bed), which continued with us for upwards of a quarter of a mile. Below it, if necessary, troops might encamp. There is plenty of tamarisk for camels, and, I dare say, grass; but it was too dark to see this latter. Again, at a quarter of a mile lower down, we fell in with water, and here first felt the sea breeze; it was very acceptable, as marching, although at night, was warm work, particularly to those on foot. In many places in this river there are some fine tamarisk trees, and towards the part where we left it (six and a half miles) the jungle is very thick, but the hills are considerably decreased in size. Higher up, they are from 50 to upwards of 100 feet in height, with steep sides down to the river bed. At 500 yards after leaving the river by its right bank, we passed a small heap of stones called Ched-i-Bohur, (Bohur's collection or gathering), near which people occasionally encamp, but the water is said to be two or three miles distant at present. Three miles farther on, after gently ascending, is the head of the Kohun river, such a miserable little *nullah* that at first I could not distinguish it, but it very rapidly increased to the dimensions of a mighty river with high precipitous banks, but quite dry. Its bed, like that of the Pinj, is a splendidly smooth road, with a very apparent descent. In only one place would artillery meet with any obstacle—this is at the Trup-i-Kohun, which is much narrower than any part of the Bolan Pass, being only ten or twelve feet wide, and crossed by rough fragments of rock. 300 yards lower down are a few holes of water. At sixteen miles, five furlongs, the Kohun joined the Poorallee river, down which we have come a couple of furlongs farther, and encamped on the right bank among the trees, which are here very thick and afford good shelter, but I would recommend no one to select so confined a spot, for the mosquitoes are most annoying, and the sea breeze so much excluded that at noon the thermometer indicated 104 degrees, and while I am writing (6 P.M.) it stands at 90 degrees. We have descended 1729 feet in this march, and now the climate appears quite changed—the heat all day has been most oppressive, and I have experienced a degree of weariness and lassitude such as is common to the Konkun in India at certain periods of the year, and I could easily fancy myself there, for that peculiar noise, like the action of water, which the wind makes among the tamarisk trees and those of the cassarina kind, resembles the beating of the sea against the shore.

POORALLEE RIVER, 16 miles 7 furlongs. Height above the sea, 860 feet.

The supply of water is plentiful and excellent, and fire-wood, grass, and camel forage abundant.

Wat is the word for "mouth" in Judgallee, the language of the Lus province; and the place where the Kohun river enters the Poorallee is called Kohun-wat, and is the usual encamping ground.

8th November. Monday.—Road very good; for two miles and three quarters it lay down the bed of the Poorallee, the last quarter mile being through thick jungle, and then along its left bank nearly the whole way, crossing numerous rivers and nullahs. At five miles and a quarter we passed a singular-looking hill called Kunnur Cheree. The country is now more open, the high mountains are left behind, those to the eastward are a considerable distance off, while those which separate the province of Lus from Mukran are just appearing to the westward. We are pitched close to some fine fields of jowarree and rice on the right bank of the Poorallee, which is here of great breadth. Excellent water from a running stream which supplies the Mill (Assea) lower down. Plenty of grass, but camel forage less abundant than hitherto.

Sur-i-Aseea, 9 miles 3½ furlongs.

9th to 15th November.—We entered the Poorallee at two miles three furlongs, and continued down it for about two miles; it is rather rough from small stones, but not so as to impede guns. At three miles and three quarters Aseea (the Mill) lay off to the right a short distance, and at seven and a half miles Turrurro. At eight miles five furlongs we passed close by Sanjaree, from which village to Belou our road was through narrow lanes of brush-wood jungle, (chiefly the excellent camel forage peeloo,) which must be entirely avoided by artillery.

Shuhur-i-Belou, or Bela, 11 miles 2 furlongs. Height above the sea, 391 feet.

Belou, or Bela, is the residence of the Jam or Chief of the province: it appears to stand as an island, elevated about twenty feet from the dry bed in the centre of the Poorallee river, whose banks, however, are here exceedingly difficult to define; and I imagine that in very rainy weather this flat country is inundated for miles, and that on the decrease of the water it is quite accidental what course the running stream may select. Bela has no fort; but the part where the Jam lives is fortified by walls, and contains 23 houses, three of them upper-roomed. Besides these, there are in the town 450 houses, chiefly made of *wattle and dab*, and all with bad geerees (ventilators), facing the sea breeze; of these 50 are empty, but probably only temporarily, most of them are padlocked. There are 120 bunias' shops open, and apparently well supplied with goods, and 23 shut, two shops of the makers of the sandals peculiar to this province, and strikingly resembling those of the ancient Grecians, two shops of the makers of women's shoes, seven of tailors, four of carpenters, two of blacksmiths, four of goldsmiths, four of dyers in blue (Neerolee), three of potters, two of ubbruk (printers of cloth for *wearing apparel*), three of confectioners, one of a butcher, one of a gunpowder maker, and eight of oil-makers. There are also 13 musjids. The

streets do not appear to me so narrow and dirty as those of Kilat, but in some places the effluvia is far more disagreeable. The inhabitants are principally Hindoos. East of the town, on the lower ground, are two arruts (wells with Persian wheels, worked by camels) and two wells without wheels; on the west, two arruts, and on the south, one.*

There is a small hamlet, called Saberanee, containing six houses and one well, about one mile and a half to the east of the town; and a couple of miles to the south-east is another of the same size, Chetaree, both occupied by the slaves and other dependents of the Jam. About two miles to the south-west is Got-i-Oosman, (Oosman's village, called also Guddor), it has two wells, four Bunias' shops, and 50 houses, and is inhabited by the Guddor tribe of Noomrees, whose chief is Jogee the son of Oosman.

The province of Lus commences at the Kohunwat, and extends southward and eastward to the Hub river, on the south being bounded by the ocean, and on the west by the Harho range of mountains. Its length is about 120 miles, and breadth 50: its soil is in many places particularly good, but of late years the lamentable want of rain has limited cultivation to the supply of water afforded by the Poorallee and Kulhullee rivers.

The principal grand divisions of the population are the Noomreea, the Shekh, and the Roonja, with a small sprinkling of Brahooees, pronounced here Brahees.)†

15*th November*. *Monday*.—I left Bela at a little after three o'clock this afternoon, and after proceeding seven miles five furlongs, through devious paths and a dense jungle, reached Dundo at six o'clock. I could learn nothing of my baggage until after I had lain down by a well for an hour, when I was told that my camels had been seen at some distance moving onwards; after particular inquiry, I ascertained there was "Ungrezee saman" on the camels, and going one and a half miles further, I found my people. The man who accompanied me had mistaken the road; the one by which my servants came is very good and straight, and eight and a half miles by measurement. I cannot say the same of the

DUND, 8 miles 4 furlongs.

* About one koss eastward of the town is a mound, said to have been the site of the former Bela. The tradition is, that the inhabitants were a most iniquitous and depraved race; and that once upon a time a Mussulman Fukeer, a man who, on account of his great piety, had great power in God's *karkhana*, (as the expression is,) came to the town, and only one man was to be found who would receive him and give him a lodging; to him the Fukeer made known that the place would on the following day be destroyed, by being turned upside down. This accordingly occurred, and the epithet *Khara* was affixed to the subverted city, expressive of its having been destroyed in anger.—Anger, كهر ڻا, it is said, means to become angry.

† I have omitted a table I have drawn up of the tribes, as during my subsequent residence in the province I have had better opportunities of making a correcter one, which will appear in another paper, with other matters concerning Lus.

other; in is through narrow lanes for some distance, and almost the whole way through thick jungle, requiring much clearing for the passage of guns and loaded camels. At two miles two furlongs from Bela I passed the small village of Yakoobanee, having one well and 20 houses, occupied by some of the Roonja tribe. Dundo has 30 houses, one well, four Bunias' shops, and is held in *eenam* by Khan Mohammed, a relative of the Jam's, and one of the chiefs of the Chunnarazy Jamotra, while the other chief, Khalikdinna, holds Dund, containing 20 houses and one well.

BOCHAPEER, 8 miles 4½ furlongs.

16*th November.* *Tuesday.*—Road pretty good; it seems to be merely sundry camel tracts through tamarisk jungle, and over fields now apparently deserted, I suppose for want of water. Near to where I am pitched is a well of very muddy water, but good if allowed to settle. There is abundance of tamarisk for the camels, but no grass. At one and three-quarter miles we passed the spot named Treehara, where there is a large white tomb and several graves.

BOCHEREE RIVER, 8 miles 2 furlongs.

17*th November.* *Wednesday.*—Road extremely good the whole way, although at first leaving our ground it was difficult to find it; it lies through jungle at times extremely thick, requiring cutting away in some places, but artillery might travel the whole distance with great ease. At about half a mile from last stage we passed several graves and the tomb of Bocha Peer. At three miles we crossed the shallow and dry bed of the Wareeur river, which higher up to the east is called the Kunkeeun: at about six miles we passed the Sookun river, but first several nullahs belonging to it, and also several graves and the tomb of Sabur Peer. At seven miles seven furlongs, the Bocheree river, and a furlong further on a nullah running into it, crossing which we struck off to the right, and passing the tomb of another Bocha Peer, encamped in the river. There are two wells here with good water, and in one of them plenty of it. Camel forage is abundant, but no grass.

OOTUL, 12 miles 3½ furlongs. Height above the sea, 356 feet.

18*th to* 20*th November.*—Road very good the whole way; in one or two places where it lies in a narrow nullah, for a short distance it would require levelling for artillery, but this could be easily done, the ground being very soft; at one place, five and a half miles from Bocheree, the bushes must be cut away, and it is just after this that one of the narrow nullahs is. We crossed several rivers, but none of any consequence. At about the first mile the Ghar, 60 yards broad; at four and a half miles the Kippeewullee; at four miles six and a half furlongs, the Laeewarroa; at five and a half miles the Jarruk; and at ten and a half miles, the Kulhullee, 240 yards broad. At ten and three quarter miles we were stopped for a short time by a rapid nullah, swollen suddenly by the rain, which has fallen in the hills. At nine and a half miles is the small village called Dooloowallee, having one well and 20 houses; and at nearly ten miles is another, somewhat

larger, having one well and 25 houses, belonging to Dureea, chief of the Mandurra, who occupy both these villages.

Ootul contains 7 wells about 60 feet deep, 200 houses, and 30 Bunias' shops, and is chiefly occupied by Hindoos; there are also 2 shops of tailors, 2 of sandal-makers, who also tan their own leather, 1 of a blacksmith, and 1 of a carpenter, who is likewise skilled in turning. There is no grass, but abundance of excellent camel forage here, and kurbee can be purchased. The Naib is Rehimdinna; he is appointed by the Jam, and is a good-tempered looking old gentleman, with a nice white beard, unpolluted with the abominable red or blue dye so much used in this country.

Five furlongs to the south of Ootul is Dooroowallagot, containing 1 well and 20 houses; it belongs to Jam Dooroo, a near relation of the Jam's. Three furlongs farther is Kulla, occupied by some of the Boorra tribe; it has 1 well and 15 houses.

21st November.—Road very good the whole way; for the first mile it lay through narrow lanes and by the two hamlets last mentioned, and then through thick jungle of wild caper and tamarisk: at 2 miles 7 furlongs we came upon the bank of the Kantro (or Kulhullee) river, and proceeded with it on our left 3 furlongs, (passing a *nullah* requiring smoothing,) and then crossing it, continued through a low jungle extending to Shekh Raj, which is a miserable village chiefly occupied by Bunias; it has 25 houses and 7 shops of Hindoos and Memuns, and is supplied with water from the Poorallee—but should that river be dry, water is said to be obtainable by digging 6 or 8 feet. The head man is Khalikdinna, who is the principal chief of the Shekhs; he resides here, but is at present absent at Bela. There is no grass to be had, but kurbee can be purchased—camel forage abundant; the water is very muddled from the late rain, but as far as I can judge of it in its present state it is good.

SHEKH RAJ, 11 miles 5 furlongs. Height above the sea, 0.

Lyaree * is 5½ miles to the N.W. by W., and I am told it contains 100 houses and 20 Bunias' shops; its Naib is Darogah Billal, a slave of the Jam's. The inhabitants are principally Hindoos; its cultivation depends on the water from the Poorallee, and when this fails the people go to Ootul and elsewhere.

22d November. Monday.—Shortly after leaving Shekh Raj, we crossed the stream which supplies it with water; it is about 30 yards broad, and waist deep; the road is pretty good, through jungle, and for some distance from the stream over ground covered with nice green grass. This spot is merely a halting ground; there is no village; the water is in 4 pools about 3 feet deep, in what looks like the bed of a river or else dry swamp. It is over this, I imagine, that at a period of copious showers

CHURROON, 4 miles 5 furlongs.

* Le is the *Judgallee* for tamarisk, which abounds densely about this village, whence its name; perhaps it should be spelt Learee.

the dammed up waters of the Poorallee extend. At this ground there is very little camel forage, and that little bad.

22d to 26th November.—Road very good. At about the eighth mile there is a ridge of deep sand, which would be very heavy for guns, and close to Sonmeeanee there is another sand range less heavy than the first; neither of them, in my opinion, is above twenty feet high. It was not until I ascended the last, and was close to the town, that I caught sight of the sea, the view of which, with its associations, must always impart indescribable delight to the heart of an Englishman.

SONMEEANEE, 14 miles. Lat. 25° 25′ N.

The opinions regarding the Poorallee and the position of Sonmeeanee are very conflicting. Lieutenant Pottinger, in his travels, says the village is advantageously situated on the southern bank of the Poorallee river; Captain Harris, of the Bombay Engineers, states it is "on the eastern bank of the Poorallee;" and Captain Hart, of the 2d Grenadier Regiment, that it is "at the extremity of a large but shallow *bay*," but in the map which illustrates his pilgrimage to Hinglaj the Poorallee is made to disembogue into this bay. Major Outram blends the Poorallee and Vindur rivers in one, and places the village on the west of the latter. Mr Masson does not (in the extract of his writings I have seen) specify the situation of the village, but, speaking of the western *continuous* hill range, says that it closes on the ocean beyond the point where the Poorallee effects its junction. I do not understand whether he means close upon the point—if so, the distance of the river from Sonmeeanee must be very great, as the nearest *detached* hills are 34 miles distant, and the continuous range much beyond; but perhaps he may be understood not to be speaking *exactly*, and in this case there will be an agreement between his statement and the result of my inquiries, which is, that this junction of the river and sea occurs 8 *koss* (between 16 and 20 miles) west of the town. In corroboration of the opinion that the river enters the bay, I must mention the other account I have heard, and which also I am inclined to believe; it is, that the river below Lyaree divides into two, one portion running westward as above-mentioned, and the other finding its way into the bay; but as it spreads and covers a large space, and resembles a marsh rather than a river, this may be the reason why its existence as the latter is denied. In addition to this, I find Lieutenant Carless, of the Indian Navy, writes, that from the spot 4 miles N.E. of Lyaree, where the Poorallee receives the waters of the Hub (query, the Kantro or Kulhullee?) to its mouth, the river has *no bed;* that, "as the river fills during the rains, the dam (constructed to confine the waters) is swept away, and the water escapes through a level plain covered with bushes, about 5 miles broad, which it inundates to a depth of two or three feet. This plain is bounded by the sand-hills on the coast, and extends in a winding direction to the mouth of the river, which is situated at the head of the harbour of Sonmeeanee, and only runs 4 or 5 miles into the land."

Sonmeeanee is on the eastern side of the bay, close to the edge of the sea, and in some places not more than 30 feet from it at high-water. It appears increasing in importance and inhabitants, for I observe the foundations of new houses being marked out: at present it contains about 600 houses of all kinds.*

There are 12 wells here—mere holes dug in the sand; in some the water is drinkable, but in others exceedingly brackish; the best is got from some holes near the British agency, 600 yards from the village; the supply in them is very scanty, but they soon fill again after being emptied. There is no grass here, and very little camel forage; wood can be purchased, it is brought in daily from the jungle.

I have endeavoured, in giving an account of each day's march from Kilat to this port, so to particularise the road traversed, that the reader may be enabled to form his own opinion upon it.. Of its practicability for artillery, it must be apparent there can be no doubt, provided attention be paid to the repair of those portions specified as requiring it, and for this purpose a few pioneers would be necessary. If properly defended, troops would experience severe loss in attempting to force some portions of it, particularly in the Pinj and Kohun rivers. Of the two routes which unite at the Baran Luk, that by Nal, from all I have heard, is preferable to the one by Wud; in this the natives are unanimous, and those hired Brahooee camel-men who were with Captain Leeson's detachment, which marched by the latter road, and who came on after it was repaired, say, that though it is now better than it was before, yet if left to themselves they would never travel by it, as there is nothing on it for their camels to eat. It will perhaps be the best for troops to march by when the country is properly settled, on account of there being more villages upon it, where commissariat supplies could be stored; but at present these are no advantage, and the scarcity of forage of all kinds will always be a drawback. In length there is no difference in the roads, if the village of Nal be avoided, and Khoorma-i-stan be made the next stage to Tegh-ab.

From Bela to Sonmeeanee, my route lay to the east of that travelled by the artillery, and is somewhat longer; I am unaware of any advantage it may have over the other, excepting that in rainy weather it is more passable.

From Kurrachee to Kwetta, *via* Roree, (near Sehewan), Larkhana, Shikarpoor, and the Bolan Pass, the distance is about 550 miles, and from Sonmeeanee to the same place, through the Jhalawan districts, it is about 390 miles; in reference to the question which route is best for troops, I have no hesitation in saying the latter is in every respect preferable. The cost of camel hire alone for Captain Leeson's detachment, a mere handful of 200 fighting men and a few horses, is 32,350 Company's Rupees; so that, to march a large force, the expense in the present state of the country would be enormous—but this, on occasions

* The Paper alluded to in the note at p. 142 will contain further particulars regarding the village of Sonmeeanee.

of emergency, would be more than counterbalanced by the rapidity with which troops could be poured into the upper country. As to personal safety to stragglers, there is a strong comparison to be drawn: in the Bolan, to remain behind intentionally is to be guilty of *felo de se*—not so in the Jhalawan territory: from the particular inquiry I have made on this head, I am perfectly satisfied that, though a straggler would be robbed, yet he would not inevitably be murdered too; this cannot be said of the Sarawan districts and their bloodthirsty occupants, whether they are at war or peace with us. I believe no description of harm was experienced by Captain Leeson's detachment; and with regard to myself, it has been seen how unmolested I have travelled, and this comfortable state of affairs was not caused by any terror of grape and canister. I was personally unarmed, and almost always alone with the moonshee and a sowar or two, and might easily have been cut down or shot at any time.

In conclusion, I must request great indulgence in behalf of this Journal. Unfortunately, the instruments with which I was supplied to survey the road were so extremely bad, that my labour has been inconceivably increased; and since the hour I left Kilat, the mapping down of the daily work, rendered extremely intricate by the innumerable observations I have been compelled to take, has so entirely consumed my time and occupied my attention, that I have been utterly unable to make inquiries on many points of interest, so that these pages are necessarily wanting in much valuable information.

GEORGE HENRY ROBERTSON, Lieutenant,
25th Regiment Bombay Native Infantry.

A ROUTE FROM THE TOWN OF MANDAVIE IN CUTCH TO HYDRABAD, THE CAPITAL OF SCINDE, AND KHYRPOOR ON THE INDUS.

Names of Places.	Distance.	Nature of the Road.	Appearance of the Country.	Wells and Tanks.	REMARKS.
From Mandavie					
To Syjah,	7¾ miles.	Good.	Rich and highly cultivated.	Wells.	A fort in the village in tolerable repair; the residence of the proprietor, a Jarejah Rajpoot. Inhabitants about 700.
To Bahil,	4 miles.	Do.	Do. do.	.....	A small village. Inhabitants about 500, chiefly cultivators.
To Sabrye,	7 miles.	Do.	Do. do.	.....	A town, with about 800 inhabitants. The walls have been in ruins since the earthquake of 1819. Belongs to a Jarejah.
To Warrah,	11½ miles.	Do.	Rich black mould.	.....	A small village, belonging to the Rao of Cutch. 200 inhabitants.
To Teyrah,	11½ miles.	In some places heavy and sandy.	Do. do.	Two large tanks.	A large and populous town, belonging to a Jarejah. It is walled in, and well supplied with water. The population is said to be 3600, with 750 ploughs.
To Badra,	11½ miles.	Winding and sandy.	Jungle, with little cultivation.	.....	A small village, belonging to the Rao of Cutch. The inhabitants are said to be 800; but it is supposed the number is overrated. Soil very poor.
To Mhurr,	7 miles.	.....	Sterile and unproductive.	.....	A considerable place, held by a Gosain, called the Capree Rajah, in *enam* from the Rao of Cutch. It contains 12,000 inhabitants, and is celebrated for its alum mines, which yield to the Rao a yearly revenue of one lac of Kories.
To Kora,	8 miles.	.....	Wild and dreary, with low jungle for five miles, then a low range of stony hills.	Tank.	A small village, belonging to the Rao of Cutch. Contains about 500 inhabitants. It is supplied with water from the tank, all the year round.
To Omersea,	9 miles.	.....	Level and uncultivated.	.....	A small place, with 125 inhabitants. Belongs to the Rao.
To Luckput,	5 miles.	Sandy.	Undulating and totally uncultivated.	Tank.	A considerable walled town, situated on a low range of hills on the confines of the Runn, which separates Cutch from Scinde. A large tank, south-west of the town, supplies it with water. The surrounding country is barren, and, together with the Runn, presents an appearance of gloomy desolation.

From Luckput To Kotree, in Scinde,	6 miles.	A Ferry across the Luckput Creek.	.....	.....	The bunder is two miles north-east of the fort, the road to it crosses part of the Runn, and being always flooded by spring tides, becomes a muddy swamp during a great part of the year: the bunder is merely a collection of a few ill-built houses. Large boats cross to Kotree with the tide, but the doondees or flat-bottomed boats can cross at all times; the distance is six miles, but horses and camels can cross by a shorter route at a ferry. Kotree is the landing-place in Scinde. There is neither fresh water, house, or shed here. The country around, as far as the eye can reach, is a desolate tract resembling the Runn of Cutch.
To Lah,	15 miles.	Good. Admitting of a horse walking at a uniform pace of three and a-half miles per hour.	The first nine miles over the Runn or Salt Desert; the last six miles, stunted jungle abundant.	Fifteen or twenty wells.	Lah is merely the name of a halting-place in the desert, where there are 2 trees, a few bushes, and 15 or 20 wells of brackish water. There are no houses whatever at this place, which can only be distinguished in the desert by the two babul trees. A saline plant called darun, or lana, grows here, which forms the principal food of the camels in this desert. Here is a small frontier post of the Scinde government. Water may be produced in many parts of this desert by digging wells to the depth of 18 feet, but is of a very inferior description. A few days' rain would render this desert impassable, the soil being of such a nature as not to absorb water, which remains upon the surface until absorbed by evaporation.
To Bhorr,	About 24 miles.	Narrow, but good.	A hard clay, without stones. Many sheep tracks constantly cross and run off the road, which is easily lost unless a compass is used.	.....	Bhorr is merely a collection of a few huts. The inhabitants are principally Juts and Mohannas (all Mussulmans.) The country around is perfectly level, and well irrigated by canals and water-courses, and produces rice, tobacco, barley, and sugar-cane. In this country wheeled-carriages are unknown.
To Chundan,	13 miles.	.....	.....	.....	A small village of about 250 huts, and 900 inhabitants, of whom 250 are Hindoos. The neighbouring country is well watered by canals, whose banks are fringed with trees and bushes. The country is level, and highly cultivated.
To Shakapoor, or Kapoor,	18 miles.	Intersected by canals and water-courses.	Level and well cultivated, studded with babul and other trees.	.....	The principal productions are rice, sugar-cane, barley, and tobacco. Soil rich. Shakapoor belongs to Meer Gholaum Houssein Khan, (N.B.—this was in 1832,) and contains about 3000 inhabitants, the greater proportion of whom are Lohannas (Hindoos.) Near the place are the ruins of a large fort and city. A canal 80 feet in breadth, and 18 feet deep, exists here.
To Meerpore,	9¾ miles.	Along the edge of the	Varied, in some parts cul-	.....	A large walled town, belonging to Meer Ali Moorad (in

Names of Places.	Distance.	Nature of the Road.	Appearance of the Country.	Wells and Tanks.	REMARKS.
		canal, which is crossed by a bund: it is a mere footpath, and the bund is passable only in the cold season, and at even then only for horses and camels.	tivated, in others waste, and intersected by water-courses.		1832.) The walls are built of mud. The population is about 10,000. The bazaar contains upwards of 300 shops, and the walls enclose a space of three miles.
To Bulrey,	10 miles.	.....	Well cultivated.	.....	The road to Bulrey passes the village of Deokun, containing 300 houses, and 700 inhabitants, and a large and populous town called Jokh. Bulrey is a pretty town, surrounded with large trees, and contains about 800 houses, and 2000 inhabitants, chiefly Syuds and Fuqueers. It contains a large mosque, and tomb of a saint. There is a *mela* in March.
To Doondy,	9 miles.	.....	Tamarisk jungle, and cultivation alternately, intersected by water-courses.	.....	Doondy contains 500 houses, and 1500 inhabitants. There is a tolerably large *ghurrie* in the centre of the village, but of no strength. There is a deep water-course north of the place.
To Sunneaja, and Katteear, and Teekoor,	Not mentioned in the journal.	Frequently crossed by broad and deep water-courses.	Soon after leaving Sunneajah, the road runs on a high and broad embankment, built in order to form reservoirs for irrigation. The road, until within a short distance of Katteear, is on the top of this embankment. The country appears as if it were under water in the rainy season. From Katteear to Teekoor through cultivated fields.	.....	These water-courses would impede and delay an invading army from their frequent recurrence, but the soil is so soft and free from stones, that pioneers could easily throw a bridge such as exists over the Bund at Shakapoor. It is formed of the branches of the tamarisk, and covered with earth.
From Teekoor to Karawe,	From Doondy to Hydrabad is somewhere about 25 miles.	Leaving Teekoor, the road is along the left bank of the Indus for a mile, then passes through a shikargah, then four miles to a low range of hills called Gunjah Jub-	The shikargahs are enclosed jungles; after leaving it the road is through a rich and highly cultivated country.	.....	At Teekoor, the road joined the left bank of the Indus, which is here three quarters of a mile broad, with a current of one mile and three quarters per hour. A little below Teekoor the Fullalie rejoins the Indus. The former was crossed at Teekoor, where it is 30 yards broad, and 18 feet deep. There were 20 boats of different sizes, all flat-bottomed, and from 10 to 30 karrars burden. A boat

		bool, along the foot of which it winds.			of 30 karrars burden would contain 80 men in crossing the river, but for a voyage of several days not more than 35 or 40 men. Teekoor is not a large village, scarcely containing 200 houses. Karawe is on the right bank of the Indus, and the halting place is on the left; from it the city of Hydrabad is visible. A little on the right of the road is a wund or temporary village called Shah Mean ka Wassud.
To Hydrabad,	.....	From Karawe to Hydrabad the road is along the base of the low range of hills about five miles.	The last mile to Hydrabad is through cultivation.	.....	The city of Hydrabad is situated on the same rocky ridge as the fort, and contains 10,000 houses, and extensive bazaars.
To Doosmun Boodanee,	14 miles.	First mile nearly N. to the tombs of the Kaloras, then a little eastward six miles through low jungle to the Fulalie river, eighty yards broad, about three feet deep across the river, and along the left bank to the village of Doosmun Boodanee.	The low jungle is apparently a shikargah or hunting preserve: after crossing the Fullalie the country on the left bank is highly cultivated.	.....	The road from Doosmun Boodanee to Jekra ka Gote passes the large town of Muttaree with a population of 3000 souls. It is surrounded by large trees and extensive gardens, and is within three-fourths of a mile of the Indus, from which the fields are irrigated, and produce wheat, barley, and indigo.
To Jekra ka Gote,	Not mentioned. Five hours' ride.	Road to Jekra ka Gote winding through jungle, with cultivation near villages—the latter part from Muttaree very narrow, and winding through tamarisk jungle.	Near Muttaree, the country is highly cultivated.	.....	Jekra ka Gote is merely a village of twenty huts, and is badly supplied with water, which is brought from a watercourse nearly two miles off.
To Halt or Halla Gunga,	20 miles.	Road passes through Salarrah and Gotanna, then crosses a deep watercourse, then ten miles more to Halla alternately through cultivation and jungle, road is narrow and winding.	Country perfectly flat, soil a rich clay.	.....	From Jekra ka Gote, the road passes the town of Salarrah, containing 500 houses and 1200 inhabitants, distant one-fourth of a mile from the Indus: one mile from Salarrah on the edge of the river, is Gotanna, a small village. The Indus here is about one mile and a-half in breadth, and the current one mile and three quarters per hour. Halla is a large and populous town, with 4000 inhabitants, and a rich and extensive bazaar, which is partly covered in; one-half of the town belongs to a Peer Mukdom Noon.
To a Syud's Tandah,	12 miles.	The road is through a wild uncultivated country, with nothing but jungle.	Perfectly level, but covered with jungle, chiefly babool.	.....	From Halla to the Syud's Tandah, the only objects passed on the road were a Fuqueer's hut, and the tomb of a Belochee.
To Limba ka Komb,	16 miles.	Very winding and narrow —crosses a deep watercourse south of the village.	.....	.....	Limba ka Khomb is a large, though partly ruined, village, with 300 houses, and 900 inhabitants. Rice is not grown in this part of Scinde: the chief productions are tobacco, barley, jowarree, and wheat.

Names of Places.	Distance.	Nature of the Road.	Appearance of the Country.	Wells and Tanks.	REMARKS.
To Chie,	8 miles.	.....	.....	.....	Persons proceeding to Khyrpoor by this route must provide themselves with supplies at this place, as none are procurable till they reach Lalloo.
To Nuwaub Shah ka Gote,	5 miles only in a direct line.	Four miles from Chie the road is crossed by a broad and deep water-course, full to within two feet of its banks; being here impassable, turned off to the eastward through thick jungle, six hours' march to Nuwaub Shah ka Gote; from thence one mile to a village called Fuqueer ka Kooa, a village of twenty huts.	.....	.....	Chie contains 100 houses, 12 shops, 350 inhabitants, and belongs to a Syud. Nuwaub Shah ka Gote belongs partly to a Syud, and contains 100 houses and 400 inhabitants. It is considerably out of the direct route, being forty miles from the Indus.
To the Tomb of Bulloo Jerdaree,	14 miles.	.....	Through a miserable, deserted country, with remains of villages and towns.	.....	Ten coss to the eastward of this tomb Lieut. Del'Hoste was told that there was another river nearly as large as the Indus, called by the natives, Narrah.
To another Tomb,	5 miles.	.....	.....	.....	.....
To Kotree,	5 miles.	Road similar to that described above.	.....	.....	The people here have no idea of distances, and give very vague and incorrect replies to questions on the subject.
From Kotree to Lalloo,	26 miles	From Lalloo to Chang road similar to that described above.	The whole country between Nuwaub Shah ka Gote and Chang may be termed a desert, and little or no water is procurable in the hot season.	.....	On the road to Lalloo pass a small village called Bendy, consisting of a few huts, and one brackish well. Lalloo only differs from Bendy in possessing one shop. Near Lalloo is a small mud fort, capable of containing 300 men. The walls are of mud, and in pretty good repair. Road to Chang passes the village of Belooche ka Gote.
To Chang,	12 miles.	.....	.....	.....	Chang contains forty houses and 100 inhabitants. There are several wells, one is pucka, nearly ninety feet deep.
To Khandearah,	23 miles.	The first eight miles through tamarisk jungle, the latter part through cultivated fields and across a deep and broad	.....	.....	Khandearah contains 100 houses, and a population of 400. There are a few wells of good water, and one or two tolerable shops.

		water-course, called the Meer Wah, cut from the Indus.			
To Butehrah,	7 miles.	.....	....	.....	The village of Butehrah is situated in a thick tamarisk jungle; a low range of hills is visible to the right, distant eight or nine miles.
To Lalloo,	8 miles.	.....	.....	.....	.....
To Chodarah,	12 miles.	Through tamarisk jungle and cultivation alternately.	.....	.....	.....
To Khyrpoor,	15 miles.	Winding and sandy.	Undulating, but producing nothing but jungle plants.	.....	The road passes a fort called Bejee ka Killa, three miles distant to the eastward among small hills. The direction, which hitherto was N. and N.N.E., varied to the westward.

Extracted and condensed from Lieutenant DEL'HOSTE's Journal of Colonel POTTINGER's Mission to Scinde in 1832.—Government House, Parell, Aug. 5, 1838.

REMARKS.—The within route was travelled by me in 1832—the latter part of it disguised as a native. I was much struck with the desolate appearance of the country between Syad ka Gote and Khandcarah, nearly the whole of which was a desert. The remains of villages, and canals, with sundry tombs in tolerable repair, prove that in former days the country was fertile, and its present state is to be attributed to the inconstancy of the Indus, which, having changed its channel forty miles West, fertilises another part of the country. At the time this part was flourishing, the Narra was the course, and it ran out by Luckput—here I first knew (at Lalloo) of its existence, and although my account of it given in 1832 was doubted, having merely stated what I heard from Natives, I have since had reason to know it was correct, having followed it from Omercote to near Sukkur. There cannot be a more singular tract of country in any part of the world than the 300 miles that intervene between Kasba and Sukkur, an account of which had been sent to Government, and also to the Society. It was my intention to have drawn up a report of this desert, but I found that with the routes of Lieutenant Creed and others from Sukkur via Jeysulmeer and Balmeer and Deesa, and my own reports and surveys from Deesa via Kasba, Omercote, and along the western edge of the desert, that it was tolerably known, but the centre remained, and may be a field for some enterprising travellers. It is mentioned by Rennell, that Herodotus supposed this desert to contain numerous Oases. I cannot learn that this is the case, but it offers a field of inquiry.—June 1st, 1842.—E. P. DEL'HOSTE.

*Brief Historical, Geographical, and Statistical Memoir on Okhamundul.** By Captain G. L. G. JACOB, 1st Assistant to the Political Agent in charge Katteewar.

(*Presented by Government.*)

Okhamundul is a triangular tract of land lying north and south, about 30 miles in length, and 14 or 15 in breadth, situated between a small Runn, the Gulf of Kutch, and the sea. Its chief towns are Dwarka and Bet; Wurwala, Posheetra, Arumbhra, and Dhenkee, &c., are the principal villages. It originally belonged to the tribes of Wadhel Rajpoots and Waghers, in the following proportions, viz. :—

Wadhel Rajpoot.	*Wagher.*
Bet.†	Dwarka.
Arumbhra.	Dhenkee.
Posheetra.	And the subordinate villages
Wurwala.‡	thereto.

And the subordinate villages thereto.

These tribes principally were indebted for their support to the heavy tax (kur) exacted from pilgrims to Dwarka and Bet, and to plunder, both by land and sea, to which they were greatly addicted; the revenue customs were accordingly very limited, and the agricultural resources less. The origin of these tribes is lost in obscurity: by some they are supposed to be aborigines of the soil; their habits now are as described by the Greeks 2000 years ago.§

Between the years A.D. 1801 and 1804, the inhabitants of Bet and Dwarka were concerned in the plunder of a vessel belonging to merchants of Bombay, during which act they flung overboard a lady and gentleman, who were passengers in the vessel.|| The circumstance becoming known in Bombay, armed vessels were sent against Okha, but after remaining a short time, they returned reinfectâ. Government, however, directed that Okha should give compensation for the loss sustained; but the call made on the chiefs was not attended to: the confidence they felt in their own strength induced them to make light of the British power, and circumstances prevented their immediate coercion. In A.D. 1807 Colonel Walker, the then resident at Baroda,

* Commonly written Oka, but I have followed the correct orthography.

† The island of Bet is situated in the Gulf of Kutch, and is communicated with from the mainland by a ferry. It is also called "Shunkoodhur," from its resemblance to the shunk or "conch" shell, and from the Duct Shunkasoor having his nativity there. It is 15 miles long by 2 broad.

‡ A small fort, known by the name of "Kutchee Ghur," is situated near this place, belonging to the Rao of Kutch. It was built to protect Kutch vessels from the pirates of the country.

§ It has been stated, without, I think, satisfactory proof, that they may be traced to Kutch.

|| Such is my information, but I have no documentary proof of the allegation.

came into Katteewar with a considerable force, accompanied by Weethulrao Dewanjee, as the Guickwar's representative. Colonel Walker, conjointly with the Dewanjee, wrote, directing the chiefs of Dwarka and Bet to settle regarding the required compensation; but this mandate met with no better consideration than the one from Bombay. Things remained in the same posture as before, and Colonel Walker returned to Baroda.

The chief of Mallia having committed great excesses, Colonel Walker came a second time into Katteewar with a force, and on his arrival at Mallia he carried the place by assault, in the month of July* 1809. The monsoon setting in about the same time, he was detained in that neighbourhood until its termination, when, accompanied with the Dewanjee and his army, he proceeded to Dwarka, with the view of bringing about some arrangement with its chiefs, as also punishing the inhabitants of Bet and Posheetra for their excesses. After his arrival, he got the Wadhel Rajpoot and Wagher chiefs to enter into agreeements, promising for the future to abstain from their excesses, and fixing the amount of compensation for the Bombay vessel plundered, and for sundry minor offences, at one lakh and ten thousand rupees. Sudaram Bawa, Karbharee to the chief of Bet, and some others were expelled from office, and security was taken from those whose conduct most needed it. The state of affairs at Poorbundur now called Colonel Walker's attention to that quarter, and he accordingly proceeded thither with his force, and entered into arrangements by which the British were to receive one half of the sea customs of the place, and they, on their part, were to furnish the Rana with a company of native infantry to protect his country. After this, the force was sent away to different places out of Katteewar, with the exception of one battalion, which was stationed at Palliad. Colonel Walker returned to Baroda, and shortly after quitted India, being succeeded by his first assistant, Captain Carnac, our recent governor. In A.D. 1810, the Okha chiefs, in violation of the engagement so recently entered into by them, rebelled, and recommenced their marauding and piratical excesses, which induced Captain Carnac to send the detachment from Palliad with a small party of Guickwar Horse, who succeeded in putting a temporary stop to these disturbances.

The disturbances in the Nuwa Nuggur State prevented attention to the affairs of this quarter until A.D. 1813, when Captain Ballantine, who was residing at Ambrellee, supervising the Guickwar affairs, sent for the chiefs of Bet and Dwarka, in consequence of their not paying the stipulated compensation, and threatened them with severe measures. In the following year they paid about a third of the demands against them, but still continued their excesses. The want of faith in the Okha chiefs, and their unconquerable propensity to plunder, at last forced on

* I am somewhat uncertain of the exact date, from the absence of the documents of that period.

government the necessity of taking determined measures: the capture of the district was, therefore, resolved on, and its cession to the Guickwar, who set great value on it in consequence of its celebrity as a place of great sanctity in the eyes of all Hindoos. It had been found necessary, in 1815, to employ a force in Kutch, and the opportunity was embraced of the return of these troops to carry out the intentions of government regarding Okhamundul. Colonel East crossed over with his force—a body of Guickwar troops, under command of the Dewanjee, took up a position at Soorya Bunder—and the district fell, with but trifling resistance, into the hands of the British by the beginning of March 1816. Soondurjee Sewjee was appointed as its temporary manager, and he continued so for fourteen months, until, in the following year, Okha was made over to the Guickwar, who paid up the balance due by the late chiefs of Okhamundul, and the difference of amount of expenditure exceeding the income of the place from the time of its capture to that of its transfer; it was also arranged to allow the late chiefs a stated sum periodically for their maintenance. The chief of Posheetra was permitted to retain possession of his village, but to remain subordinate to the manager stationed by the Baroda government at Dwarka. In A.D. 1818, under Ragoo Bullal's administration, Putramal Manik, one of the Bhayad of the chief of Dwarka, committed some excesses, which were suppressed by a detachment of Guickwar troops with some difficulty. In the following year, 1819, Ramrao Dajee succeeded Ragoo Bullal in the Kumavisdarship of Okhamundul; he, however, remained but a short time in the situation, when the Guickwar, with the concurrence of Captain Carnac, appointed Mr Hendly to it. He remained in this situation for little more than a year, when the late chiefs broke out into rebellion, and, proceeding to violence, many of the inhabitants were killed, wounded, and taken prisoners. Mr Hendly found it necessary to retire to Poorbunder; the authorities at Baroda, hearing of the state of things at Okhamundul, immediately directed some troops stationed at Sirdar to move to that quarter, under the command of Colonel Wilson. They proceeded, however, no farther than Khumbalia, whence negotiations were opened with the rebel chiefs. The cholera broke out among the troops whilst here stationed for about three weeks, and certain disturbances in Kutch drew off the force into that quarter without effecting any settlement of Okha affairs. In the rains of 1820, the chiefs deputed a mission to wait on Captain Ballantine, then residing at Joonaghur, but, not being prepared to surrender their recently regained authority, it of course failed in its object. On the opening of the season, the army, at the time engaged in Nuggur Parkur under the command of Colonel Stanhope, was ordered to proceed on Okhamundul and recapture it. It accordingly came down to Mandavee, and thence crossed over to Okhamundul in November 1820. Dwarka was taken by storm, and the district speedily reduced. Mooloo Manik, the chief of Dwarka, and Veersee Manik, his younger brother, were amongst the number who fell in the assault, and on the British side Captain Marriot was killed,

and other officers wounded. Rana Shigramjee, the chief of Bet, and Bhyo Manik, Veeda Summua, Nagjee Manik, heads of the Waghers, were taken prisoners. Rana Shigram was removed under confinement to Surat, and the other three as prisoners to Ahmedabad—and Okhamundul was once more made over to the Guickwar, who appointed Phurusram Bulwunt [commonly called Baba Wusackur] as Kumavisdar. As a precautionary measure a wing of a battalion of native infantry was stationed there for its protection, and Captain Elwood, the officer at Poorbunder, was directed to proceed to Okhamundul for the purpose of supervising its affairs. This gentleman after his arrival consulted with the manager, and decided what sum should be allowed the late chiefs for their subsistence. In six months the district was brought into order; and Captain Elwood, after dismissing the wing of the battalion at Okha, returned to Poorbunder. Owing to some relationship existing between Rana Shigramjee and the Rao of Kutch, and Jam of Nuggur, these two chiefs interceded for him, and the Rao becoming guarantee, Rana Shigramjee was permitted to return to his family. The three Waghers also were sent back from Ahmedabad, and the political agent at Rajkote made them over to the Amrelle authorities, who released them on their furnishing the requisite security. The district of Okhamundul has not since required a military force to assist the civil power, and, with trifling exceptions, the hardy and daring spirit of its former masters has slumbered: the piratical spirit of its population is not, however, entirely quenched; a Kumavisdar of Okha, named Narayun Rao Wenkatesh, is now in confinement under sentence of the Political Agent's Court, for employing some boats in plunder in A.D. 1839.

The district of Okhamundul contains 54 villages, including 10 that are now waste—the names, number of houses, and population of each, are given at the end of this paper. The Guickwar owns the lands of 51 villages—2, viz., Dransunvel and Posheetra, belong to the Grassias of the country, but subject of course to the Guickwar's authority, and one to the Rao of Kutch. The soil is very poor, and bajree and til are the only grains that thrive. Mehmuns, Sonees, Sutwaras, Brahmins, Aheers, and Whers, are the chief farmers and cultivators; and they give annually, on each soutee,* a bhog (payment in kind of 70 manas—viz., 17½ maunds of 40 seers each, seer of 40 Rs.,) and 2 corees in ready money. The agriculturist depends on the monsoon for his supply of water—wells being very scarce: lands belonging to the village of Warwala have some, consequently the farmers of it have to pay an extra tax in addition to the usually exacted bhog.

The Runn, which all but makes an island of Okha, is about 15 miles in length; at its mouth, in the Gulf of Kutch, it is about 5 miles broad, and it narrows gradually towards Muddee, where its breadth is a mile, and is there separated from the sea by a narrow bank of earth

* As much land as can be tilled by a plough with a pair of bullocks.

and sand. It is a salt marsh, and at high tides wholly covered by the sea from a foot to a foot and a half in height, which enters it between the villages of Pindara and Posheetra, the former belonging to the Jam of Nuggur. This circumstance, however, does not impede the passage of men or carts across it; owing to the levelness and hardness of the surface, 100 carts abreast may cross it at all seasons of the year. Salt is naturally produced on it, and the inhabitants are permitted to collect it without any tax.

Okha has two bunders, viz., Bet and Roopun; the former accessible to vessels of 500 khandees, and the latter to not more than from 150 to 200 khandees.* The exports from these bunders consist chiefly of ghee and til, sometimes cotton, the produce of other places. The imports are principally sundries from Bombay. The prickly pear grows profusely all over the district of Okha, where it is interspersed with the babool. Thick jungles are thus formed, which afford shelter to outlaws and thieves. The sites of these localities are between the villages of Dhrewar and Gorinja, and in the vicinity of Churukha, and near Posheetra: the first is about two miles in diameter: these places are known amongst the inhabitants by the name of Khudas.

No metals are found in this district, which may be pronounced barren of aught save superstition and piracy; and, I should add, camels of a small species, which are bred here for sale in Katteewar. Its annual revenues fall short of half a lakh of rupees. The last official statement gave 42,000, whilst its expenditure, including 11,346 rupees, pensions to the disinherited chiefs, is 72,000 rupees—the difference being made good from the Guickwar's more fruitful talooka of Amrellee.

I have been informed that fossil organic remains are to be found near Bet, and the shells here thrown up are famous all over India. The gathering of the conch shell (shunk) forms an article of revenue, it being farmed out for a trifling annual sum. The influx of pilgrims to the shrines from all quarters of India ranges from between 5000 to 10,000 per annum; but on the years in which Kupeela Chut falls, so many as 100,000 pilgrims are said to assemble, to bathe in the sacred waters of Gomtee.

* Boats also occasionally touch at Posheetra and Arumbhra.

STATISTICAL TABLE OF THE OKHAMUNDUL DISTRICT.

Nos.	Names of Villages.	Estimated		Remarks.
		Number of Houses.	Number of Inhabitants.	
1	Bet	500	3000	
2	Posheetra	200	600	Enjoyed by original proprietor, Megrajee Wadhel Rajpoot and family.
3	Rajpura	100	300	
4	Samlasur	50	150	
5	Gorecalee	100	300	
6	Kuranja	30	90	
7	Moolvel	30	90	
8	Moolwasur	40	120	
9	Kutoomba	20	60	
10	Arambhra	100	300	
11	Sooruj Guradee	—	—	Waste.
12	Bheemranah	50	150	
13	Mojub	40	120	The Grassia Poonah Nayannee Wagher cultivates the ground, but is subject to the Rao of Cutch.
14	Kutchee Ghur	40	120	
15	Mukundpoor	30	90	
16	Borketra	—	—	Waste.
17	Rungpoor	10	30	
18	Wurwalla	300	900	
19	Keelapoor	60	180	
20	Padlee	10	30	
21	Gureehee	50	150	
22	Nagasur	25	75	
23	Rungasur	30	90	
24	Wusae	150	450	
25	Teeturia	10	30	
26	Mehwasa	20	60	
27	Tobar (Mhotee)	30	90	
28	Tobur (Nhanee)	20	60	
29	Drasunvel	100	300	Belonging to the chief of Posheetra.
30	Dwarka (Gomtee)	700	3500	
31	Ladwa	20	60	
32	Umrapoor	50	150	
33	Dheenkee	60	180	
34	Churukla	—	—	Waste.
35	Bhawroo Dhanaharoo	10	30	
36	Bhowroo Sominanoo	10	30	
37	Lowuralee	50	150	
38	Drewar Dhandaree	15	45	
39	Drewur Rayanee	5	15	
40	Ghoreenja	10	30	
41	Bardia	50	150	

Nos.	Names of Villages.	Estimated		Remarks.
		Number of Houses.	Number of Inhabitants.	
42	Moranoo . .	20	60	
43	Waehoo . . .	25	75	
44	Muddee . . .	—	—	Waste.
45	Ruttoo Paree . .	10	30	
46	Korunga . .	50	150	
47	Sangun Kotree . .	—	—	Waste. At high tides isolated, and affords a refuge to thieves.
48	Uneealee . .	10	30	
49	Koderoo . .	—	—	
50	Bateesoo . .	—	—	
51	Ditto . . .	—	—	Waste.
52	Chundrodee . .	—	—	
53	Timbree . .	—	—	
54	Kuntardee . .	—	—	
	Grand Total .	3230	11620	

(Signed) G. L. G. JACOB, Assistant, Katteewar.

RAJKOTE, 14*th July* 1841.

Reports on the Soda Soils of the Barramahal, and the Kaolin Earth of Mysore. By Captain J. CAMPBELL, Assistant Surveyor-General.

(*Presented by Government.*)

To the Chief Secretary to the Government of Fort St George.

1. SIR,—I have the honour to forward two Reports upon the Soda Soils of the Barramahal, and the Kaolin Earth of Mysore, which I request may be laid before the Right Honourable the Governor in Council.

2. Unnecessary practical details have been omitted in these reports to prevent their being extended to a tiresome length, and, for the same reason, I have not forwarded samples of the soda to elucidate the progress of the manufacture, nor specimens of the crucibles formed of the Kaolin, to show the effect which heat produces; but should his Lordship in Council be pleased to call upon me for further information, I shall then forward what I am directed to prepare.

3. It was my intention, in drawing up the report upon the Soda Soils, to have solicited his Lordship in Council to afford me the sup-

port of funds for more extensive experiments, to be able to ascertain, with some certainty, the probable expense of the manufacture; but, on further consideration, I feel that my stay in this district will be too brief to produce any satisfactory result; and also, because it will be necessary for me to go over again some of the southern portions of the district to complete my information upon its geology and mineral products, for a descriptive work which I am now compiling.

I have the honour to be, &c.

(Signed) J. CAMPBELL, Captain,
Assistant Surveyor-General.

ROYACOTTAH, 20*th April* 1841.

REPORT ON THE SODA SOILS OF THE BARRAMAHAL.

1. Soda soils are very common in the principal plain of the Barramahal in the Salem district, which is bounded on the north by the hills of Congoondy, on the east by the Jawandy Hills, on the south by the abrupt break in the levels at the Sapoor Ghaut, and on the west by the hills of Royacottah.

2. In extent they are generally not more than about half a mile square. The soil is sandy, and incapable of supporting vegetation—no herb growing on them, but a scanty scrubby grass. In general, they lay upon a bed of kunkur, which is sometimes, as near Paulcode, of considerable depth.

3. These beds of soda soil are well known to the natives, who call them in Tamul, Chour-munnoo, and extract the soda for the purpose of fluxing pounded white quartz to make bangles with. The Dhobees also collect the earth, and by lixivating it, make a solution of soda, which they use in washing clothes, by adding quick lime to make the solution caustic. But so ignorant are they in general of the principle of the mode of use, that they often convey the earth sometimes fifty miles, not being aware that the labour of carriage might be decreased by extracting the salt.

4. The bangle-makers extract the impure soda by mixing the earth with water in a pit, and allowing it to settle; the solution is then drawn off, and evaporated by sprinkling it on cow-dung spread upon the surface of a granite rock. When the cake has become about half an inch in thickness, it is taken off and is broken into pieces, in which state it is called Chour-billah, and is stored in houses for use, sometimes to the amount of 400 maunds.

5. The Chour-billah is sold at the rate of 17½ rupees per ton, and contains 23 per cent. of insoluble matter, the soluble part being in greatest part all carbonate of soda, with a little vegetable and extractive matter, and some muriate and sulphate of soda in small quantity. A solution of it will not crystallise, in consequence of the extractive

matter, and the natives are quite ignorant of the mode of crystallising it, and do not even know that it contains a salt.

6. In Bengal soda soils are also found; but, according to Dr O'Shaughnessy, ("Manual of Chemistry," p. 227,) it contains 15 per cent. of sulphate of soda, which salt, being more soluble in hot than cold water, cannot be separated by crystallisation from the carbonate; and the product of these soils in Bengal cannot, therefore, be applied to any useful purpose, unless the very expensive process of decomposing the sulphate by fusion in a furnace is resorted to.

7. Being engaged in an extensive chemical examination of the minerals of this district, in which pure carbonate of soda is required in considerable quantity as a flux; and as the price of the salt, as vended in retail at Madras, is very great, it has occurred to me to endeavour to supply the want from the mineral resources of the country.

8. I have found by experiment, that a very pure carbonate of soda may be separated from the crude soda, which the soils of the Barramahal yield, by simply charring the Chour-billah, or the residue, after evaporating to dryness in a gentle heat, by which the extractive and vegetable matters are converted into charcoal, and can then be simply extracted by filtering, and the solution will then crystallise on evaporating to a pellicle. The first crystallisation gives a tolerably pure soda, coloured a little by the impurities; but after crystallising three or four times, the crystals are beautifully white and transparent; and after six crystallisations, the salt is so pure as hardly to give any precipitate with nitrate of barytes after supersaturation with nitric acid, denoting thereby the nearly total absence of any muriate or sulphate.

9. In England great quantities of carbonate of soda are required in glass-making, soap-making, and dyeing. This was formerly prepared from the Spanish barilla, which contains, according to Dr Ure, muriate and sulphate of soda, lime, and alumina, and only, at most, 24 per cent. of soda. A large quantity was also made from kelp prepared in the Scottish Isles; but this is no longer manufactured, as it has been found that, in consequence of the cheap price of sulphuric acid, soda can be manufactured by decomposing the muriate of soda (common salt) at a price which remunerates the manufacturer.

10. In this operation, the muriate is first decomposed by heating it in leaden vessels with sulphuric acid, by which the muriatic gas is driven off, and which is condensed and allowed to run to waste, as of no value,—the demand in the arts for muriatic acid being very small. The resulting sulphate of soda is then mixed with charcoal and some lime, and is roasted by a powerful heat in a reverbatory furnace, by which it is partly decomposed and formed into sulphuret of soda, which, by further heat and stirring, is again decomposed, and the sulphur volatilised, and an impure mixture of carbonate of soda, ashes, and charcoal results, which is called in trade "black-balls," and is an article of commerce.

11. This impure product is then further purified by solution in water,

filtering, and evaporation to dryness, without crystallising, in which state it is called "soda ash," and is used by the glass-blowers.

12. The salt is still very impure, being mixed with sulphate and muriate of soda, and does not contain its full equivalent of carbonic acid, being, in fact, a mixture of caustic and carbonate of soda.

13. For the makers of plate glass, who require a very pure carbonate of soda as a flux, to prevent the chance of the glass being discoloured, the soda ash is mixed with sawdust, and is again fused in a powerful furnace, by which it is fully carbonised and rendered capable of crystallising. It is then dissolved in water, and is crystallised once for the use of the plate glass makers, and six or seven times for the use of the apothecaries. In the latter state it is sold for 10d. per pound retail, or 52 per cent. wholesale. In this state I have found, by experiment, that the article is exactly the same as the product described in paragraph 8, and the two are therefore equally valuable.

14. For the plate glass maker, the necessity of having the flux pure is so great, that the expensive process of decomposing common salt by pearl ash (carbonate of potash) is sometimes resorted to, and the resulting muriate of potash being little crystallisable, the carbonate of soda is separated by evaporation and crystallisation.

15. The cost of manufacture, from the Indian mineral soda, cannot be ascertained but by extensive experiment; but as it will be seen that the process I have described (paragraph 8) is very much the same as that in making saltpetre, the inference that the expense will be nearly the same in both manufactures may be allowed; and as saltpetre is made for two rupees per maund, therefore it would seem that nearly pure carbonate of soda can be manufactured in South India for less than five rupees per cwt.

16. As the soils which yield this product are now quite unproductive, and the time required for the manufacture is during the dry weather, when the ryuts are unemployed, the agricultural produce cannot be affected, while the revenue will be certainly increased.

17. While the cotton trade of South India is so rapidly increasing, an article for export which will serve the purpose of dead weight for ballast in the ships will be much required; and as carbonate of soda is not affected by exposure to air or damp, it may be packed in bags, and will be useful for the purpose.

18. As these soils are of limited extent, and as the manufacture cannot be carried on during the whole year, therefore the produce must always be limited; and the introduction of the article into the markets of England cannot affect the present market price, because the quantity yielded in India can only take the place of a certain quantity now produced by the manufacturers of England, and the price will always therefore be regulated by that at which the English manufacturers can afford to sell.

19. On the introduction of the Indian soda into the market of England, the manufacturers will doubtlessly endeavour to prevent its sale,

by underselling it, even going so far as to sell their own manufacture at a loss; but as it has been shown (paragraph 15) that the Indian soda can be made for little more than 10 shillings per cwt., it would seem impossible that the endeavour to exclude it from the English markets could be successful.

20. I have been unable to procure certain information regarding the price at which the inferior kinds of impure soda are sold in England, but when the expensive and laborious process described in paragraphs 9 and 10 is considered, it seems almost impossible that any product can be made at so cheap a rate as that procured by the simple manipulation required for the mineral salt.

21. I have endeavoured, by sending to England samples through a commercial gentleman, to make this report more complete by being able to state the value of the article on certain grounds, but have been unsuccessful, the point appearing to depend in great measure on the import duty which will be charged in England. By the present regulations, natural alkali imported from places within the limits of the Honourable Company's Charter pays a duty of 2s. per cwt.; but to ascertain the point, it appears to be necessary to ship a few tons, and then try by experiment at what rate of duty the article will be admitted.

I am aware that some years ago attempts have been made to introduce Indian soda into the English market, but which failed in consequence of the opposition of the English manufacturers; but I submit that the soils now pointed out, yielding by single crystallisation a pure soda, were not before known, and, in consequence, in the former experiments to which I refer, it became necessary to fuse the salt for the purpose of purifying it, which expensive process of course prevented a successful competition with the manufacturers of England.

(Signed) J. CAMPBELL, Captain,
Assistant Surveyor-General.

REPORT ON THE KAOLIN EARTH OF MYSORE.

1. A great portion of the level surface of the table-land of Mysore is formed of a red ferruginous arenaceous earth, resembling much some of the softer varieties of the upper red sandstones of England.

2. This formation, which may be called for convenience "Red Marle," is superposed upon a continuous bed of hornblende granite, and is connected with it by a graduation both in structure and composition, through an interposed layer of white kaolin earth, which is found between the two.

3. The kaolin is, in some places, several feet in thickness, and is generally of a pure white colour and soft greasy feel, and is sometimes mixed with a fine quartoze sand in small quantity.

4. This kaolin is mentioned by Dr Heyne, who mistook it for pipe-clay—a mistake which seems strange in an observer generally so correct in his remarks and researches.

5. The extent of this bed of kaolin I have not had an opportunity of ascertaining; but I know that it is found from Bangalore as far north as Nundydroog.

6. That this kaolin is fitted for the manufacture of the finer kinds of pottery and porcelain, I have not been able to ascertain by direct experiment, in consequence of the laborious process, and, to an individual, expensive apparatus required to grind it down to an impalpable powder by stones of hornstone under water; but from its mineralogical characters, I believe there can be little doubt of its being of finer quality than many kinds in England.

7. My attention was called to the mineral in consequence of being engaged in researches on the fusibility of the rocks and minerals of the Salem district—generally called igneous, in which it was necessary to expose them to a very high degree of heat in a wind furnace sufficiently to fuse cast-steel, and for which I could procure no crucibles at a sufficiently cheap rate; and I have found this kaolin, when mixed with an equal quantity of finely-pounded quartz, to fully answer the purpose of affording crucibles and covers upon which the most intense heat has hardly any effect, the outside being only slightly, by the alkali of the fuel, and the crucible being very slightly softened. They are also much superior to those called Hessian, in not cracking unless by very extreme changes of temperature.

8. In Calcutta there are probably many manufactures carried on in the fusion of metals, &c., where this earth would be of great value; and it might even be useful in the manufacture of fire-bricks for lining furnaces, &c., if the carriage by land for 200 miles would not render them too expensive.

9. At Madras, at the mint, for making mufles and crucibles; at the gun-carriage manufactory, and in several other manufacturing depôts, this kaolin might be useful, and a manufacture of the articles might be either established at Bangalore, or the earth itself might be transported.

10. Coarse chinaware is an article of import from China, and plates of this ware are purchased in considerable quantities by some of the natives at 4 annas each, while it is reasonable to suppose that these articles might easily be manufactured in Mysore at a cheap rate, without the necessity of any very expensive machinery being required.

(Signed) J. CAMPBELL, Captain,
Assistant Surveyor-General.

Memoir, in Three Parts, of the River Euphrates. Drawn up by Commander H. B. LYNCH, of the Indian Navy, while in command of the Euphrates Flotilla.

(*Presented by Government.*)

Memoir to accompany the Chart of the River Euphrates.

Sheet No. 1.—The survey of the River Euphrates was commenced in the month of October 1841, in the steam vessels *Nitocris* and *Nimrod*, under the command of Commander H. Blosse Lynch, assisted by Lieutenants Campbell, Jones, and Grounds, I.N.

A series of chronometrical measurements connect the river at the light-station below Bales with the Mediterranean at Sawediah and Alexandretta, and with the cities of Aleppo and Antioch.

The chart shows the river in its lowest state, and is constructed from trigonometrical measurements from a base line, measured on the level plain between Bales and Giaber. The instruments used were a brass chain, 66 feet, 8-inch theodolite, by Gilbert, (a very good instrument,) and excellent sextants by Troughton and Sims. The chronometers were an eight-day, M'Cabe, No. 262, Hedger's eight-day, No. 473, and a pocket chronometer by Tobrias, No. 179. The astronomical positions were determined by single and meridian altitudes of sun, moon, and stars, and lunar distances. The scale of the chart is one inch to a geographical mile, taken at 2025 yards. The bed of the river is shown in the chart twice its actual breadth, to enable the shoals to be more clearly visible on that scale.

The sheet No. 1. extends from Bales to the mines of Edhein. The Euphrates, in this part of its course, during the low seasons, is extremely shallow in many places, and is navigable only by vessels drawing not more than two feet water. The bed is composed of loose pebbles, which are easily movable by the stream; during the spring floods, (when the current is very rapid), they are swept along the straight reaches, and through the narrow parts of the river, and deposited where the rapidity of the stream is checked either by its becoming wider, or by some natural obstacle or sudden change of course. The river, in its lowest state, may be properly described as a succession of long deep pools, with slight current, divided and held up by shallow pebbly bars extending across below them from bank to bank. The current is rapid over these bars, from $3\frac{1}{2}$ to $4\frac{1}{2}$ miles per hour, but the log does not show the degree of velocity, or the resistance a vessel would have to overcome in ascending over them, as the line of current is in all considerably inclined; very light vessels alone could be got past them, and poling might in some cases be requisite; indeed, all vessels employed on the Euphrates should be furnished with poles and sweeps for the more speedy passage of these obstacles.

The most difficult passages are lettered in the chart, and a separate

description given of them; the river, however, frequently changes its bed, and no permanent directions can, therefore, be given for passing them; vessels employed on the river would, however, find little difficulty from the change, as it is gradual, and the channel generally remains the same during the low seasons, and is easily perceived.

A light, powerful, and swift steam-tug would be the most efficient vessel for navigating the Mesopotamian rivers; if necessary, nothing but the engine and boilers should be in the vessel,—fuel, stores, and crew might be accommodated in a tender attached to her stern, in the manner of the tender of a locomotive engine on a railway; in difficult places, the tender might be veered astern till the tug was above the rapid, when she would easily draw up the tender; the difficult part of a rapid does not extend generally beyond a few yards, above which the stream is comparatively slow and easily navigated. The length of the vessel may be 150 feet, by 20 beam, but it is of great consequence that the vessel should be light and manageable.

The Euphrates, after passing Bales, runs, to the east by south nearly, through a rich valley to the ruins of Ethdeheen: from the summit of these latter the cliffs over Bales can be perceived, and the eye ranges over a broad level valley, bounded by a low line of hills, whose summits are on a level with the great wilderness that extends to the cultivated parts of Syria and the rich cities of Aleppo and Damascus; through this valley the great river is seen winding from side to side, producing in it the richest verdure and dense forests of the tamarisk, in fine contrast with the parched desert above, and the white chalk cliffs that mark the boundary between them. In the vicinity of Bales the average breadth of the valley was found to be four miles.

The valley of the Euphrates in this part is owned and partly cultivated by the Arab tribe of Woldee; they are divided into several parties under their respective Sheiks, who acknowledge Silama Dundun, who rules the largest encampment near Racca, as chief of the whole tribe. Their numbers, position, &c., are as follow:—

Sheik Kulluf, 15 miles below Bales on the right bank.

Number of tents or sheds, 150.

Miri, or land tax, payable to Aleppo per annum, £80.

Sheik Mahomed-ool Furridge, cousin to Sheik Kulluf, and situated just below him; number of tents and miri as Sheik Kulluf.

Sheik Ahmedool Nasir, principal chief of the tribe on the Mesopotamian side of the river, opposite to the last-mentioned Sheik.

Number of tents, 300.

Miri, or land tax, to Orfa per annum, £250.

Mahomed-ool Hussain, five miles below Giaber, right bank.

Number of tents, 140.

Taxes to Aleppo, £80.

Silama Dundun opposite Racca, great Sheik.

Number of tents, 500.

Taxes to Aleppo, £250.

The above comprise the whole of the tribe of Woldee, with the exception of a few families scattered along in places in charge of buffaloes. They cultivate wheat, barley, durra, sesame seed, and a few fruits and vegetables, and possess flocks of sheep, goats, and bullocks; there are flocks of buffaloes met on the banks under the charge of a few families, who do not engage in agricultural pursuits.

Small caravans between the Euphrates and the neighbouring cities of "Aleppo" and "Orfa" exchange the surplus "prepared butter," skins, wool, and sesame seed, for the more simple articles of British manufacture of those cities, as shoes, boots, spear heads, horse shoes, and other necessary articles; they also supply the wandering Arabs with coin.

The portion of the tribe on the Syrian side of the river are under the government of Orfa.

The religion is Mohammedan, of the Sunnee sect; they have no mosques or public places of worship—the beautiful call to prayer is, however, the first sound the stranger hears in their tents.

The men of the tribe are below the middle height of Europe, strong, and well made, of a light brown complexion; the women are slight, and in youth handsome, but the custom of imposing on them all the drudgery of the menage, and much of that out of doors, with the early age of marriage, soon deprives them of their personal charms; they do not, as in cities, hide their faces from strangers, but mix freely with the men. Cupid, when he crosses the Euphrates, sometimes sends a shaft among them, but, in general, marriage is arranged between the parents, and the lady given at a certain value, in most cases to a member of her own family when of any rank or wealth. The costume of both sexes is very simple: a long cotton shift covering the person from the neck nearly to the feet, bound with a sash at the waist; a handkerchief is worn on the head; and cloaks of sheepskin or camels' hair are worn during the winter. The dress of the women is generally blue. The men wear swords, or carry a spear, matchlock, or club when away from their tents. Many of them possess horses, and, as well as we could ascertain, a fourth of the tribe could take the field on horseback.

The shortest line between the Euphrates and the sea would pass from Bales or Mixcheneh, where the river, after a long course from the northward, turns directly to the eastward to Antioch, passing over the perfectly level plain till near the "Orontes," where the country becomes undulating. The road would pass a few miles south of Aleppo, cross the "Orontes" twice above Antioch, and down the valley of that river to Sawediah; the road along the valley, 15 miles, is hilly, but was passed by the waggons of the expedition carrying great weights.

There are numerous villages along the road from the sea till within 25 or 30 miles from the river. The country is of a rich soil, covered

in spring with the richest verdure. Water is not found between the villages and river, except at Tress, or 5 miles nearer the river than the most eastern of the villages, called Jibbool; but wells might easily be sunk, and water obtained. The Anezi (or wandering tribes of Arabs) are said to know of wells in this tract, but keep them concealed; the splendid basin at the ruins of Selucia shows what has been there; and large remains of a city of the Saracenic age attest Bales to have been a considerable port of the Euphrates, and probably that of communication with the Mediterranean.

The numerous ruins marked on the chart are interesting only as giving evidence of the past state of these countries; the more modern are of the Saracenic age, and the ancient are now confused heaps or mounds of ruins, in many cases only recognised from natural hills by the fragments of brick, tile, and pottery scattered over them.

Bales is now deserted, and in ruins; there are no remains of any interest; the buildings are of brick, and evidently of an early period of the Mohammedan era; a minaret over the ruins of a mosque forms the most prominent feature of the ruined city. There are several remains of brick-work found in the valley of the river below Bales, and on the higher plain above it, but they are not in any way remarkable. The fine old castle of Giaber, built on an isolated hill of the desert range on the left bank, is about 18 miles below Bales, and forms a fine object over the valley. At a great distance both above and below, it is 369 feet above the level of the river, and was formerly just over the stream, which has now left it, and is 1000 yards distant. The ruins are of the Saracenic age, but there are evidences of much older building in the brick-work of the foundations; and I am led to suppose that Giaber has been an important military station long prior to the age its present ruins would appear to indicate; it is now entirely deserted, but has been occupied within the last sixty years; some of the inhabitants are still extant near Orfa, called Giabere, from the name of the place; they are said not to differ in appearance or origin from the Arab inhabitants of the country.

Opposite Giaber, on the right bank of the river, and on the cliffs, at some little distance from it, are the ruins of two Mohammedan tombs, and other remains. A short distance below them, the river winds close under a bold promontory, called by us "Hobhouse," in memorial of the support afforded by the Right Honourable Sir John Cam-Hobhouse, late President of the India Board, to the navigation of the Euphrates, and the extension of British influence in these countries. A permanent station should be formed here, and would probably be the best point from which to despatch passengers, letters, and light goods to the Mediterranean, as, although still passing near Bales, the difference between the land and river distance, (as 18 to 27,) the strength of the stream in the high, and the intricacy of the navigation in the low, season, would render it in many respects preferable to

Bales. Hobhouse is within an easy day's journey of Aleppo, over a level road, relays of horses being laid.

(Signed) H. B. LYNCH, I.N.,
Commanding Euphrates Flotilla.

DESCRIPTION OF THE BANKS OF THE EUPHRATES, CONTINUED FROM A FORMER MEMOIR.

Below Ethdeheen about four miles, and on the same side, are the ruins of Soorieh, of the Saracene age: the principal remains are those of a square fort, of brick, surrounded by low heaps of ruins. The natives have a tradition that the space between Soorieh* and Ethdeheen, and on as much farther to the bluff promontory called Sicher, was once the site of a stately city. Ruins and remnants of pottery are thinly strewn over most of this space.

Opposite Soorieh, on the left bank of the river, are the ruins of Al Billani, formerly a small octagonal temple on the cliff: there are now some rude columns † strewn around, and the ruins of a mill in the river just below it.

At Shergiani is a mound on the same range as Al Billani, and is said to be the site of an old building. A round mound is all that remains.

The bluff promontory about seven miles below Ethdeheen,‡ on the same side, is called by the Arabs "Sicher," from the remains of walls that extend from its base into the river. We found here the foundation of two walls of beautifully cut stone, extending 18 to 20 feet from the right bank into the stream, and probably still farther under water, slanting downwards, parallel, and about 20 feet apart. There are also the remains of a brick building of the Saracene age above the cliff, and there have been other extensive and very ancient buildings at this spot. The stones are beautifully cut, with the projections of the under layers carved off with great care. We were at a loss to account for the purpose for which these walls had been erected with such care and elegance, until we discovered the remains of a canal on the opposite shore running by the ruins of Heragulla (Heraclea?) to Rogga, the ruins of which are in sight from this. The Arabs state that it was derived from the river at this point, and told me a little tale, which says that a fair queen of Rogga made the formation of this canal the price of her love. The ruins we saw are doubtless those of its breastwork and defences.

* Bales?—The expression, "It is as old as Bales," is common in this part of the Euphrates.

† Fourteen inches square by two inches deep, kiln-burnt.

‡ Arabic. Thedee, paps. Thedeheen, two paps.

From Sicher the mounds of Abd Ali, Heragulla, and Rogga, on the left bank, are in sight. Abd Ali is merely a mound, on which ruins are said to have been known by the Arabs. Heragulla is a square fortress 590 paces round, on the left bank, and 100 yards distant from the canal, which extends from Sicher to Rogga. It is apparently very ancient, of stone, brick, and in the lower parts the old system of strata of lime and pebbles. On the superstructure are some arched cisterns of the Roman age. There are extensive ruins on the right bank of the canal, just below it.

From Ethdeheen the river is kept to the northward and eastward by the bold range of Sicher, round which it turns to the eastward. Three miles farther on is the promontory of Phunsah and ruins of a bridge called "Risasah," from lead having been used to cement the masonry, and which is still found among the ruins by the Arabs. I must give a more particular description of this place, as I am much inclined to believe that it possesses claims to be considered the site of Thapsacus.

Phunsah is the extreme eastern point of the river, about 80 miles from Aleppo, where it first diverges to the southward, turning from E. to E.S.E. It is a rocky promontory jutting into the stream at a point where a connexion with the opposite bank is easy. Below it the hills, of which it may be considered the northward point, break into steep cliffs 250 to 350 feet high, giving no access to the valley of the river save through difficult passes among them.

From the hill of Phunsah the eye ranges freely over the valley of the Euphrates. Below are the long range of inaccessible cliffs that bar the valley on the Syrian, and the dense forests that clothe it on the Mesopotamian, side, until cliff and forest are lost in the distance. Before you are the ruins of the bridge, the city of Rogga, and the rich smooth undulating plains of Mesopotamia, with the fertile valley of the Billeek beyond.

The natives have a tradition that the piers (in the river) off Phunsah supported a castle in the river connected by a floating bridge to the banks, which commanded the passage into Mesopotamia when the waters were high. At low-water there is a ford just above the piers, and the river is fordable in numerous places both above and below.

The appearance of a mass of masonry lying on the piers gives an air of probability to the tale that some superstructure was erected over the bridge; but there is a great difference between the beautifully carved stones that form the piers and the mass of masonry that is lying on them, and which is apparently either of a more modern date, or was a much higher part of the building, where the great care shown in laying the foundations in the bed of the river was not thought necessary.

Although I must not allow this paper to be lengthened by any discussion on comparative geography, I have thought it right to place Thapsacus at Phunsah, because it agrees with the point at which the younger Cyrus crossed the river when marching against the king; with

the circumstances of Alexander finding a broken bridge at that place, which does not apply to any other point of the Euphrates below Bales; and because standing among the mounds of ruins, tombs, and broken pottery strewn over the commanding promontory of Phunsah.

Below Phunsah is the fine plain called Kesra, from the broken abrupt cliffs that bound it on the land side: the natives say it is called Kesra from their being, in the passage of the cliffs, enabled to break and defeat all the enemies that attack them. This is, however, merely a boast, and only worthy of note as showing the difficulty of the passes on to the plain.

The ruins of Rogga are of the Saracene age, and occupy the site of Gallenicum and Nicephorum. It is the nearest point of the river to the ancient Haran, and the high road from the Euphrates to Orfa and Mesopotamian Comagene. There are no remains of any interest; the buildings are of brick, and a ruined minaret is the most prominent feature of the ancient city, which has been of great extent.

There are several traces of ruins along the river on the Mesopotamian side, as at Sheik Moosa "Alhhan" and "Sel Humaitha," but they were probably only forts of communication or caravansaries of a latter age; and, on the bold cliffs of the Syrian side, the fortress of Suffein Anchyla and Jeslah, all of the Saracenic age—or probably Saracenic buildings over older ruins—show that the valley of the Euphrates has once been well guarded.

Not many miles below Phunsah, at a place called by the Arabs "Al Ghater," is a very remarkable cavern or grotto in the cliff, with fresh-water trickling from the rocks that form its roof; the cave is about 40 yards broad, by above 100 in length, formed out of the limestone rock by the constant action of the little stream that trickles through it.

There are the remains of a canal running along the valley, midway between the cliffs and river. We traced it many miles, and it is said by the Arabs to be derived from the river near Phunsah—we could find no traces of it so high, but its direction adds probability to their account, and the river has changed its bed so much, that the canal can only be traced on the higher levels above the alluvial soil of the valley.

The cliffs on the Syrian side extend all the way to "Al Hama," where the river has broken through them—I should probably rather say, runs through them, as the volcanic matter thickly strewn on them, and from which they take their name of the Black Cliffs, would lead me to suppose that they were sent by other power than that of the river, which may have found and occupied the only passage by which it could escape to the southward, after a long course to the eastward. The beautiful ruins of "Helibe" on the right bank, occupy and command the gorge, extending from the cliff to the stream. It is of the age of the lower Roman empire, built of large carved blocks of coarse white marble. The masonry is of a high order as to strength and beauty—arches of the Roman order, with brick domes of the flat Saracenic style. It is difficult to judge whether the brick covering of these domes, and the arches

which support them, are of the same age; but an examination of the tombs would lead me to believe that they are all of the same period, the brick having been introduced for lightness and probably greater durability than the soft marble of the lower walls and arches.

The citadel is on the cliff above, isolated from, and commanded by, the surrounding cliffs, from which it is separated by a deep gorge. From the citadel strong walls with square towers extend to the river, enclosing with the river wall a triangular space, the river face of which is 500 paces, the other sides twice the length; the walls are now 36 feet in height by 8 feet thick, and the height of the citadel above the lower wall is 315 feet—the wall being about 40 feet above the level of the river. The space within the walls is nearly vacant, with the exception of the ruins of two churches, and some buildings about them. The palace is about two-thirds of the way up the north wall, on the shoulder of the cliff, and extends beyond the wall. I call it the palace, as being so termed by the natives, from being the largest of the square towers or projections from the wall, and the beauty of the arches that supported the domes—some of which remain, and the execution of the masonry render it probable that it was once the residence of the chief of the fortress.

A marble colonnade extended from the north to the south gates, the bases can still be seen, and the capitals of four orders of architecture, of a rude order, were found among the ruins.

There are traces of walls and buildings beyond the fortress, and several tombs or mausoleums stood on the shoulders of the cliffs along the valley, both above and below, while the face of the cliffs have been hollowed into caverns for the reception of the humbler dead.

The tombs or mausoleums on the projecting shoulders of the cliffs are a remarkable feature in the gorge of "Helibe." They are numerous, and in various states of ruin; two, however, remain sufficiently perfect to enable us to form a just conception of their original state. The largest is situated some little distance up the cliff, about half a mile to the northward of Helibe. The form of the building is a square of 20 feet, and about double the height, half of which shows a wall ornamented with pilasters of well-executed masonry, and the other half, now a pyramidal ruin, was probably a dome or pyramidal roof. The entrance to the tomb is now through the broken wall, where probably the doorway once was placed. On entering the tomb, a square chamber is before you, having an arched recess on each side; the floor of the recess is raised a little more than two feet on three narrow vaults, probably receptacles for the coffins of the inferior members of the house; the principal coffins were probably placed in the recess above the vaults. On the edge of the pediment three small figures stood in high relief: their mutilated forms could give no idea of the degree of excellence with which they were executed. The roof of the chamber closed in on all sides above the pediment, and though not arched, the inclining walls gave all the effect of a dome. Outside the door of the lower

chamber, which occupies all the lower area of the tomb, a staircase leads to the right along, and just inside the outer wall, encircling a middle and upper chamber. The middle chamber was different in arrangement from the one described, having merely three vaults in the side for coffins, and the recess above them on which others may have been placed. The upper or third story is now in ruins, but the traces of the staircase leading around the chamber are still visible.

Another tomb, a mile to the south of Helibe, shows a different arrangement of the interior—the exterior being nearly similar. There is the flight of steps winding from the base all round the building, and small vaults at intervals occupy the interior, which, with this exception, appears solid. In the second vault from the bottom, a coffin had, within a few years, been opened by some Arabs. We found the remains of it, and the remains of an embalmed body which they had disturbed. The coverings of the body were of very fine linen and silks, with a resinous composition, which had been used to preserve the body. A rude mask of gold was found among the rubbish in the coffin, which had escaped the search of the Arabs.

The form of the tomb, the winding steps, which brought to my mind the ascents of the more magnificent structures of antiquity; the evident practice of embalming, and the use of the gold mask, which probably, though now much flattened, bore the semblance of the tenant of the tomb, argued a greater degree of antiquity for these tombs than the appearance of the ruin of Helibe had led me to assign to it. The caves or tombs in the cliffs much resemble those of "Selencia Peria" and "Arfa," ancient Eddessa, and may be older than the principal part of the ruin, which I should assign, from its architecture, to the time when the Roman legions lay on the banks of the Euphrates.

Below, on the cliffs of the left bank, hang the ruins of Zelibe: they are of the same age, but the greater portion have fallen with the cliff into the stream below, and nothing remains to denote their particular character; a fine canal runs from them along the high level of the left bank, as far as the Khabour, which once watered the rich valley and plain between the Meosopotamian hills and the Euphrates. The canal can now be traced by its ruins. Below the gorge, the valley of the Euphrates again opens to its usual breadth, and presents a beautiful plain, on either side occupied by the Bo-Subeye, and Buggara Arabs, whose encampment commences here on the left bank. A splendid range of cliffs of calcareous stone and marble, mixed with coarse marble, bounds the valley on the Syrian side, and the hills of Mesopotamia fall far back, leaving a rich table-land between them and the alluvial valley.

The canal of "Zelibe," probably trench of "Semiramis," ran through this elevated plain, and the ruined walls of an extensive city, now called Soor-Ool Hamar, lay on the point between the Euphrates and the canal.

The long grass is now growing over the ruins, and save for their connected form, and my attention having been drawn to them, I might

have passed them as desert mounds. They are about 2½ miles in extent, of a circular shape, and the ruined canal is seen from the highest mound some distance in the interior. Soor-Ool Hamar is 7 miles from Helibe.

There are some little mounds at "Sekeran," between Soor-Ool Hamar and Helibe, but I should not have called them ruins had the Arabs not pointed them out as such, and the site of an ancient city of that name.

Some distance below Sekeran on the right bank are the ruins of Taboos, (or Thapoos. Query—Thaps ?) on the cliffs, said to represent the site of an ancient city. There is a ford over the Euphrates here at the upper end of the island of Labtar.

"Deir" is 11½ miles below Taboos. There are no remains of any ancient ruin about the present town, which is modern and of the poorest order. The houses are huddled together on a mound on the right bank of a branch of the river. The streets, as usual in Eastern towns, are narrow. There are the remains of a canal, said to have been excavated by Sultan Murad, derived from the river about two miles above the town, and extending inside it to Meadeen.

The whole intermediate space having, it is said, been thronged with villages and gardens, watered by the canals, I shall return to the subject of the canals; but I cannot help figuring to myself the richness and beauty they must have spread over the valley of the Euphrates.

There are several ruined villages on both banks of the river between Deir and the river Khabour, which falls into the Euphrates 30 miles below. The ruins of Boo Sairah or Keskesia, ancient Circesium, are situated in the angle formed by the left bank of the Euphrates, and the right bank of the Khabour. The Euphrates once ran close to them, but now at some little distance. The Khabour is a few hundred yards distant, and the principal gate and road led from the fortress or city to the ford or bridge that once led over it into the wide plain of Mesopotamia. Standing on the topmost point of the ruin, the eye follows with intense interest the paths once trod by the Ten Thousand, and the army of the philosophic Julian. The Roman city has not been very extensive—700 paces is the extreme length of the heap of ruins. There are still remains of the Roman work, but the confused heaps of modern buildings or ruins (for few of the miserable huts are tenanted) hide all but the remains of what has probably been the citadel, and the inside of a hall adorned with recesses, surmounted by the Roman arch.

From the ruins of Circesium, the fine old castle of Rahabah is seen on the cliffs on the western bank of the Euphrates. The sacred grove of Mahomed ool Imaum (?) is seen opposite it, on the eastern bank, with the plain of Dura, and the mound of the magnificent canal of Dureen, which extended from the Khabour, a short distance from where it falls into the Euphrates, to Bagoos, or Al Erzi Dureen—is probably the Masca of Xenophon.

The ruins of Rahabah, built on the cliffs two miles from the western

margin of the river, form a noble object over this part of the valley of the Euphrates, and the tomb and minaret of Meschid Ali, with the sacred grove on the left bank, add to the beauty of the scene. The castle is said by the natives to have been built by Rahab ibu Ageir il Amlachi, prior to the Mohammedan era; to have been besieged and destroyed by Ali, and re-peopled by Sultan Murad in his progress to Bagdad. It offers evidence of great antiquity, and is wholly different from the ruins hitherto met on these banks; the principal portion of the ruin is of large blocks of cut stone, of a species of coarse white marble, carved with great care round the edges on the face of the block, which is left rough and protruding in the centre, after a style, I think, known as the Etruscan, and the same as that of the Pitti Palace at Florence. The southern side of the building, which was probably the principal face, presents a long high wall, flanked by square towers at either end, and pierced with windows and embrasures in the lower floor; a range of apartments ran along this face and commanded an unbounded view of the desert, which is here perfectly level, clothed with the richest verdure, (and about 159 feet above the level of the valley.) An immense hall, built of hewn stone, of the same order, of an angular form, runs at the back of this suite, and occupies the centre of the building. Several parts of the building are of brick, as are some of the vaults under the castle, which are very extensive, arched with a slightly-pointed arch. We found the head of a flight of steps in one of the vaults, near the north-west angle. The steps are now choked up with the ruins, but are said by the late inhabitants of the castle to extend to the level of the valley, and they have heard that they once extended to the river. The river, however, once ran close to the castle, where the perfect level shows its deserted bed.

There is a deep well in the interior of the castle; it is now dry, but the water is said to have been brackish. There are also several wells of good water in the now dry ditch of the castle.

The interior of the ruin is strewn with the humbler ruins of the houses of the Arabs who within the last thirty years dwelt in the castle, and who declare themselves the lineal descendants of Rahab ibu Ageir, the Amalekite. The chief of them, who now, with the remnant of his race, reside at the little town of Meadeen, accompanied me on my visit to the ruin, and his countenance spoke strongly in favour of his claim to Jewish extraction.

The tablet of an inscription, probably Arabic, from its few remaining lines, and having been on a part which has evidently been repaired at a later date than that of the ruin, may still be seen on the outside wall of the southern face. My guide told me that he had seen inscribed stones laying about the building, but we were not so fortunate as to find any.

The castle is now deserted, the last inhabitants having been unable to maintain their communication with the river, when the Aneze Arabs first led their flocks and predatory bands to the vicinity of the Euphrates.

From the summit of the castle, the ruins of Circesium, at the mouth of the Khabour, are visible; the little town of Asharah, on the right bank, about ten miles distant; and the ruins of the canal, which I mentioned as extending from Deir to this place. The Mesopotamian side has taken the character of a vast unbroken level, but the cliffs still hold in the valley of the Euphrates on the Syrian side.

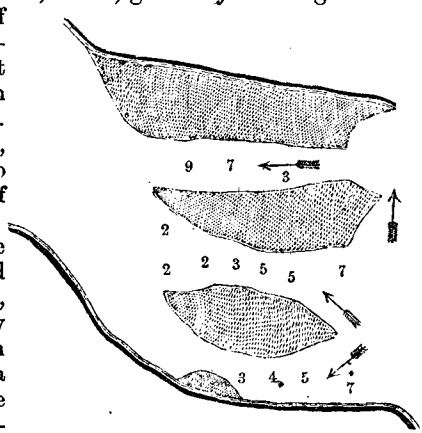
There is nothing in the little town of Meadeen to attract attention; its size, population, and revenue have been noticed under the proper head. The little town of Asharah, on the right bank, which the steamers passed shortly after leaving Meadeen, may be classed with it, except the tradition of the natives would make it more ancient. It is now only a rude assemblage of Arab huts.

(Signed) H. B. Lynch,
Commanding the Euphrates Expedition.

Description of the River Euphrates, between Bales and Giaber, in the Low Season.

After passing Bales, which is now some distance from its margin, the river is broken into several small channels, having a depth, as shown by the map, of from three to fifteen feet over a pebbly bottom, with a stream of from four miles per hour to one or one and a half.

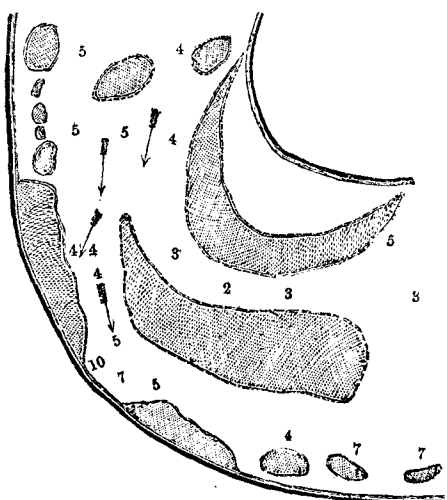
Where the stream is much divided and the bed broad, the navigation in vessels drawing more than three feet is very difficult, the passages being narrow, tortuous, and the entrance often crossed by the stream. It would be useless to enumerate the various shoal places which occur generally at the turn of every reach, the water collecting and running down under the high alluvial bank, which, gradually breaking off into a low pebbly point, throws off shoals all across the river, generally carrying a depth of three feet six inches to four feet, but in many places as low as three feet. A description of the Giaber shoal, marked in chart A, may serve to give an idea of the nature of them.



The river, in one bed of three hundred yards broad, is swelled slightly by two low pebbly banks, situated respectively about fifty yards from either side; the main body of water flows down with a depth of five feet between the heads of the shoals, till the retiring form of them allows the water to spread, when it decreases to

two feet from shoal to shoal, barring the passage to boats drawing more than twenty inches, and then difficult. Between the heads of the shoals and each bank, the pebbly ledge extends with a depth of three feet by the sounding-pole; but the obstruction being partly the cause of the swell in the stream, there is in reality not water for a vessel drawing more than two feet nine inches at most. After passing this bar, the water, which is narrowed by the form of the shoals, runs with great rapidity, and deepens the channel from five to seven feet until clear through it; the length is about 150 yards, current four miles per hour. I pass over thus cursorily the shoals in the river between Bales and Giaber, because, from the bed of the river changing with every yearly rise and fall of water, no directions could be given for passing them; a pilot will always be necessary; but it will be generally found that whichever passage the river takes on the subsiding of the spring flood, it generally maintains and deepens it during the low season: so that an officer constantly running on the stream would watch the river and easily navigate it, while, ignorant of it in heavy vessels, we find it almost impracticable.*

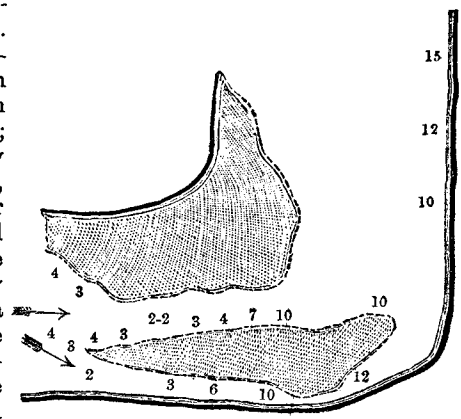
RIVER BETWEEN GIABER AND RACCA.



After passing the Giaber, or A shoal, the river turns towards the cliffs under Hobhouse Point, forming a shoal reach, at the lower part of which is a difficult rapid, B, with four feet in the centre channel. The river then runs slowly till near C, above which there is a ford with four feet water by the pole, but on which the vessels touched, in passing, with a very rapid stream. At the bottom of the reach there is a bank, formed by the meeting of two streams, (a large island having been passed on the right bank;) the passage is in the middle, with four feet water, stream very rapid. On to D the river is good, but at D the shoal extends nearly to the left bank, where there is only three

* From the description of the Giaber shoal, it will be seen that the centre passage was good to the lower end of the shoals, where it was shut up, and that the passage between the shoals and either bank was shut up at their upper part, and deep below. A similar character applies to most of the Euphrates shoal.

feet water; both steamers were forced over the bar, drawing three feet four inches, but were delayed several hours. From D the river is slow and good near the cliffs on the right bank to E, where it is divided by a pebbly bank into two branches, being nearly of equal extent; best channel under the right bank, and having only three feet water, the steamers were delayed six days. After passing the first bar the water is shoal, and passage difficult for two hundred yards, when the stream sets over a ledge of two feet ten inches to the right bank. After clearing E, and passing some cliffs on the left bank, called Maharez, (the first met on this side since Bales,) there is a fine reach of the river called Sifsaf, from a beautiful fringe of poplars on the left bank, under the cliffs, with abundance of wood on the low opposite bank. After passing this reach to the E.S.E., the river turns up to the E.N.E., and at the end of a short reach is the shoal F. Here the stream turns abruptly from a low shoal on the right bank over to a round high bluff of concrete rocks, called Ghiran. In the high season a whirlpool is formed here from the rushing of the stream against the rocky point; and though the stream now follows the same course, and there is deep water close to the point, a shoal is thrown up all across the river above it, with only three feet water, through a tortuous channel, which the steamers cleared with difficulty. From Ghiran the river is deep, with good wood on both banks, the right being steep to G, where is the ford called "Anadee," with a shoal extending from the right bank diagonally to the left, with a dry bank in mid-channel. Here the deepest water is two feet two inches, over a hard pebbly bottom: we lightened the *Nimrod* to two feet eight inches, and attempted to force her over it, but failed, fearing the heavy heaving necessary would cripple our slender resources in hawsers, boats, &c.; the vessels therefore awaited a rise of water.



The steamers were detained at the Anadee fort, awaiting a rise of water, till near the end of November, when the winter rise not having taken place as we had anticipated, the vessels were grounded on the bar, and gradually made their way through it, sometimes heaving, and sometimes allowing the stream to eat away the pebbles. The operation of eating away the pebbles occupied nearly a month, (23 days.) Below the Anadee, the next difficulty in the river occurs at the wooded

island of Abaid, where its channel is broken into several branches, with only a narrow passage of three feet, over a quicksand, which the vessels crossed, after some little difficulty and delay. The river is then good to Howej Furrej, where, just under the ruin and promontory called Al Billiani, there are the remains of brick-work in the river, over which the stream rushes with great rapidity, with three feet four inches water on the left side of the ruin. About 500 yards farther on, the water is shoal and divided into several channels, with only two feet ten inches to three feet, over sand, close to the island of Furrej. Thence the river is good to Soorrieh and on to the Sicker below, which is a difficult passage through the shoals, with three feet six inches to Risasch. Channels from this to Bales are intricate and difficult, steamers making only four to five miles per day progress.

The Risasch, or ancient bridge at Phunseh, is a mass of modern masonry in the centre of the river, off a bold promontory (called Phunseh) laying on some very fine ancient masonry of cut stone, evidently the piers of a bridge; there is three feet six inches water on both sides of them, and then by the left bank for some little distance—good wood on the banks. The river changes its character at Phunseh, and, instead of the long pools and pebbly bars hitherto met, low flat mud banks begin to appear, the river being less rapid and more even in its course, and the navigation much easier. The shoals off Racca are, however, very intricate; the passage is now on the left bank, but from their nature (species of quicksand) very changeable. At Nimrod island a bar extends across the river with only three feet, and below, along the island between it and the Mesopotamian side, are several quicksands and sunken trees, one of which went through the *Nimrod* steamer on the 16th February 1842. The passage is close in with the left bank, with nine feet water, (passage) forty to fifty yards broad. The first rise in the river occurred on the 2d of March, (about three feet,) which remained a few days, and then gradually fell to near its old level.

Below Nimrod island the river is very narrow—passage close under the right bank, then through low islands and sandbanks, winding very much to the river Beleek, which is ten feet broad, and falls into the Euphrates from the Mesopotamian side; then round Akershee, through a very narrow channel close to the right bank, inside a low pebbly sandbank with four feet water, not more than ten yards broad, just room to warp through; thence round Rahabeh, nothing less than four feet. The channel, as you approach Anchyle,* rather intricate, close to the left bank; round the second Zoor of Rahabeh by the tents of Manuedool Ghuraum, river good, until the passage of Bekerete Sheik Shebly, where there is a ford, and the river winding under the Anchyle cliff is divided by sandbanks into several branches, with four feet, through an intricate channel-passage in the centre; thence the river turns round to the rocks of Nimrod, where it is again divided

* Ain Kullah—spring of the cattle.

into several channels by sandbanks and a heap of rocks in the centre or nearer to the right bank. There is a passage with four feet near the rocks, but crooked and difficult: another passage lays along the right bank, inside a pebbly island. The spit extends from the top of the island to the right bank, having four feet of water, in little narrow channels between snags. The steamers were hauled through one of them, to avoid the rocky passage; good wood on the right bank. A low projection from the desert range comes down to the river here, on the Syrian side, and divides the Weldee and Subkeh tribes.

From the rocks of Nimrod the river is good generally, but requires much care, as sandbanks are formed at every turn of the reaches, with a passage of four feet to four feet six inches between them, till Muglah, where there are several pebbly islands, with only two feet six inches between them, except through a rocky channel close to the left bank, about 20 yards broad, with four feet six inches, through which the steamers were dropped with some little difficulty and delay. From Muglah to the ford of Kumeseh the river is difficult, through sandbanks, with three feet six inches at the shoalest place, about three miles above the ford at Aboo Chelbee, where the river is divided by four dry sandbanks, laying diagonally across, with only three feet six inches, through a narrow passage between the second and third islands, (from above.) Thence to Kumeseh, good. At Kumeseh the river is divided by sandbanks into two channels, that on the left bank having three feet close to the bank. The steamers grazed over, but would be unable to steam up at their present draught. This is one of the principal fords over the river, and is said to be as easily passed by horsemen as the Anadee; we found more water by one foot on it, but it is said to have been deepened lately—there is no safety that it may not again fill, and become shoal as the Anadee. The river is bad all the way from the ford to a place called the Khan, on the left bank, where the river touches the higher desert. There are the mounds of a square building, 40 yards square, here. From the shoals of Kumeseh, which extend about one mile below the ford, the passage is close to the right bank, by a narrow channel, through which the steamers dropped. Sheik Kudthur ool Murdood is just above the Khan, Sheik Ali ool Abed opposite with the larger part of the Subkeh. A lower range of cliffs on the right bank, between the river and the high range of desert, commences here. From Al Khan the river is good to the rocks of Breje, about eight miles below; there a ledge of rocks springs from the left bank nearly across the river, leaving only a passage about forty feet broad, with deep water close to the right bank. The rocks are under water, but the stream is broken on them all across the river, except in the passage above alluded to. Leaving the rocks, the river runs down towards the dark high cliffs of Al Hama, through which it breaks, to the ruins of Helibe and Zelibe, about four miles below the gorge. When approaching the gorge great care is necessary, as there are rocks in several places in the bed of the river, all the way to and along the

cliffs on which Helibe hangs. The gorge is about five miles in length; the steep cliffs hanging over the stream, with their limestone base covered with a thick coat of basalt; the marble ruins of Helibe reaching from the upper cliff to the stream; the ruin of Zelibe on the distant opposite cliff, with the ancient tombs laying in ruin on each projecting cliff of the valley,—render the gorge of Al Hama, or the valley of the "dark cliffs," one of the most picturesque spots on the Euphrates.

The river is good from Zelibe, where there is six fathoms under the cliff to Sekeran; it is divided into several channels by small islands and sandbanks; but three feet water, with an easy current, will be found below Sekeran, which is a low cape on the right bank, and near which there are the ruins of a mill. At the lower end of the island of Boweit, the bed of the river is much divided by banks, and under the cape and ruin of Soor el Hamar it has lately changed its bed, leaving a broad shallow channel on the right bank, and a passage with five feet through a narrow channel on the left, called Killidge Soor ool Hamar. The steamers dropped through—the passage being very tortuous, and in places not more than twenty-five yards broad.

The river is still good to the old ford of Muthlen, where it is very broad, and in the low season three feet water can only be depended on; we crossed with four feet six inches, after a rise of eighteen inches. The present ford of Taboos, above the island of Labtar, is the general passage between Syria and Mesopotamia. The passage for steamers is along the centre of the left channel, the river being divided into two great branches, which are again divided by numerous sandbanks. We found in the end of March four feet six inches, after a rise of about eighteen inches, and the natives say it is an easier and shoaler ford than Kumeseh; three feet is the most that can be depended on in the lowest state of the river.

From Taboos the river is good to the shoal of Gub al Araish, where the bed of the river is thickly studded with shoals and sandbanks, with three feet of water in the lowest season. The navigation of the river as far as Deir may also be called easy, after it is known, with nothing less than three feet six inches in the lowest season. From Taboos to Deir, the banks are destitute of wood, for the first time since Bales. *Note.*—Wood is always found between Bales and Taboos at short distances—say five to ten miles.

At Deir the trigonometrical survey of the river was given up for the season, the water having risen nearly two feet, and rising daily, rendering the examination of the shoals comparatively useless. I may conclude this description of the upper part of the river, in its lowest state, with the idea that I found, while surveying it, that the upper part of the Euphrates from Bales to Phunseh is not favourable for steam navigation in any vessel of the present day; that the portion from Phunseh to Deir is much more favourable, but not well adapted for quick communication or commercial purposes. It may be navigated in ves-

sels drawing under two feet six inches water at the lowest season. Wood is abundant, and the natives friendly, but extremely poor.

Below Deir the operations of the survey were limited to fixing astronomically the principal points of latitude by meridian altitude of the ☉ ☽ ✻—longitude by chronometer and lunar distances from the ☉ ✻. True bearings deduced from observations of the ☉ azimuth. The delineation of the river was carried on in both vessels by dead reckoning. The soundings are of little value, as they remain constant only for the day or hour in which they are taken. The places pointed out by the pilots as bad in the low season are therefore marked on their authority, which, by their comparing with some known place, may be pretty nearly depended on. Between Deir and the mouth of the Khaboor, about 30 miles of river, nothing less than three feet will be found, but a vessel drawing more would have much difficulty in passing; and the same remark applies to the river as far as Anah, although the navigation of the river improves by being much straighter, and with a slower current than found in the upper part. This part of the river is occasionally navigated by the boats of the country, drawing five feet water, but they frequently lighten to pass the difficult places, and rarely navigate either in the lowest or highest states of the river.

Isgeria rocks are probably the most difficult passage between Anah and Deir; we passed them after the river had risen about three feet, and had nothing less than six feet. The passage is close on to the right bank through a narrow passage with three feet water at the lowest season, and sufficient breadth for a small steamer. *Note.*—Only two feet in the easier channel.

From Isgeria to Anah great caution is necessary in the low season, but the river better than above; several ruins of irrigating mills are met, and rocky passages are frequent, but generally easily passed in a light vessel; wood is found at convenient distances along the river. There is a long interval between the wood depot above the Khaboor and that at Tel Millah below Asharah; and from near Algaim to Anah there is no wood fit for steaming. The cliffs on the Syrian side extend the whole length of the valley, from the head of Phunseh to Salheah. They fall back, and are lower about Deir, and rise over the river again at Tel Millah and Salheah, and then recede for some distance till Algaim; thence to Anah they gradually rise, and the country has a more hilly appearance. On the Mesopotamian side, the hills that have not been seen since their gradual disappearance at Helibe, again approach the river at Al Erzie, showing the extensive ruins of that old city on the projecting cliffs. Thence they fall back to the ruins of Bageos, and, slightly sinking, extend to Anah.

(Signed) H. B. Lynch,
Commanding the Euphrates Expedition.

Note on the Practicability of Advancing an Army from Europe into Asia by the Provinces of the Euphrates and Tigris. By Dr J. W. WINCHESTER.

(*Communicated by the Author.*)

The former importance enjoyed by the countries of the Euphrates and Tigris having in some measure, after being for centuries regarded with almost profound indifference, been partially revived, it may not be uninteresting to exhibit some of the information we are possessed of, and to calculate on the future prospects of these highly interesting regions in connexion with Asiatic and European politics.

These countries were known as the seat of a very considerable land commerce, even before the captivity of Judea, and it cannot be doubted "that these chests of rich apparel so carefully bound with cords"* came probably by interior caravans from Hindostan, and perhaps already from the frontier of China.† Rapidly, from that time, as the empires of Assyria, Medea, and Persia rose in richness and power, so did the commerce of this part of the East increase, until from Asia Minor, Europe was supplied, by an easy and safe route, with the commodities and luxuries of the whole of Asia. But when by European enterprise this commerce was converted from a land trade to a sea trade, the royal city on the banks of the Euphrates gradually declined, and with its decay the surrounding provinces, deprived of their commerce, fell a victim to the twofold oppression of anarchy and despotism. Previous to this, European invasion into the countries of Asia Minor, the empires of Persia, and also the countries bordering on the river Indus, had been frequent, and attended by a uniformity of success, only accounted for by the superior bravery and discipline of the hostile armies, as well as the facilities afforded for supporting and conveying a large force with ease and rapidity into the heart of these empires. The river Euphrates facilitated much every invasion, and its course was generally chosen as the route of the different armies advancing from Europe into Asia.

The bygone aspect of affairs in the East again draws the attention of Europe, more especially of Great Britain, who holds the empire and commerce of Asia, to these long-forgotten countries, which may yet become the soil on which the dominion of the East is to be disputed.

The contingency of Egypt's friendship, and the great uncertainty as well as difficulty of crossing an army from Alexandria to Suez, and hence to India, is so generally well known, that it would be superfluous here to enter into detail; we shall therefore be contented with stating that should either Mehemet Ali coalesce with Russia, or Egypt become the province of a power hostile to our interests, except by the tedious voyage round the Cape of Good Hope, or by the

* Ezekiel. † Vincent.

river Euphrates, Great Britain would have no road for supplying her Eastern possessions with troops to resist invasion, and to support, at the same time, the integrity of her vast possessions in Hindostan. Russia, with Persia as her ally, Khiva, Bokhara, Balkh, and Herat at her feet, would make rapid strides towards the Indus, and little time would be left for concentrating a sufficiently powerful army to beat back the invaders. Indeed, it is only from the Mediterranean that British troops could be thrown into Persia, and by the Indus into Central Asia, in time to oppose with assurance of success the large army Russia must, should she ever attempt the invasion of India, set in motion towards Hindostan. We would, therefore, throwing the Egyptian and Cape routes aside, turn our attention towards that of the Euphrates.

The Mediterranean Sea lies wholly at the command of Great Britain —her armaments and strong fortresses there render her power indisputable: whilst her numerous steamers, and the shortness and certainty of the voyage from England to any part of the Mediterranean, afford ample means for conveying to one of the islands in the upper portion of that sea, a large body of troops fully equipped, and efficient in bodily health and strength at once to undertake an arduous march; while a depot, both for troops and for provisions and carriage, might be formed on the island, from whence the main body of British troops advancing from Europe into Asia could be supplied.

The islands of Asia Minor, which were once celebrated for their wealth, beauty, and power, though now presenting scenes of desolation as complete as those the neighbouring continent exhibit, would still answer as military depots, and of them all we consider Cyprus to be the best adapted for this purpose. Cyprus, one hundred and forty miles in length by sixty-three in breadth, was the most beautiful, as well as the most voluptuous, of these isles. Still, the inhabitants boast that the soil will produce, in the greatest perfection, the fruits and grains of almost any other land and climate, and although cultivation is imperfect, the wheat is of excellent quality, and until lately was exported in considerable quantities. Wine, however, is the staple product of Cyprus, whose grapes possess a rich and luscious juice, which affords to the wines those generous and restorative qualities for which they have long been celebrated.

By the despotism of its Government this island has been reduced to nearly a desert. Its population does not exceed 70,000; and since the late Greek insurrection afforded a plea for letting loose a horde of banditti to exercise every form of plunder and cruelty, the number of inhabitants have been diminishing. Leather, carpets, and cotton cloths of good quality and durability of colour, are the manufactures of the present day. Collecting medals and other antiquities, with which the island abounds, is also a source of considerable gain to the inhabitants, whose principal seaport is Larnica, on the southern coast. Larnica, though the ancient harbour is choked up, has a good roadstead, in

which Levantine ships trading with Malta, Egypt, and Smyrna anchor.* The character of the inhabitants, subject for a series of ages to tyranny and oppression, exhibits nothing noble. Their appearance is highly Grecian, and their females possess great beauty.

This island's proximity to the mainland eminently adapts it for a depot, from whence troops and their equipage may be transferred to Latakia or Scanderoon, sometimes called Alexandretta. But although this last seaport possesses a fine road, and is the only good anchorage in Syria, still from its being surrounded by extensive marshes, and liable to endemic diseases, the former would perhaps be the preferable place to land troops at, were they likely to be detained any length of time previous to marching on Aleppo, the modern capital of Syria, which, by the disastrous earthquake of 1822, became almost a heap of ruins, and to this day has not regained any of the importance it enjoyed when the emporium of Syria. At this city further preparations must be made for crossing the desert to the river Euphrates, and for gathering materials to construct rafts and boats, and putting together steam vessels to convey the troops and munitions of war into the lower provinces of that river.

Surrounding Alexandretta and Latakia the country is almost desolate, and cannot yield any great abundance of supplies. Volney wrote of these regions—"Everywhere I saw only tyranny and misery, robbery and desolation. I found daily on my route abandoned fields, deserted villages, cities in ruins . . . . ;" and as the face of the country is still unchanged, it would be futile to expect this part of Asia to furnish other supplies than forage and firewood. The former can be readily procured in some abundance from the banks of the Atry or Orontes, whilst the neighbouring wooded districts would furnish the latter.

From the sea coast to Aleppo, the roads, though difficult, are practicable, and the march from Latakia or Scanderoon would occupy five or six days. Julian crossed his army from Antioch to Berda (Aleppo) in two laborious marches, halting at Aleppo on the third day.

Aleppo is the capital of the Turkish pashalik of that name, and might be expected, as a friendly power, to assist in procuring carriage, chiefly dromedaries and mules, for conveying an army and its stores to Birr or Beles, after which the march would be along either bank of the Euphrates. The route from Aleppo to Birr is across a sandy desert, and would occupy a considerable space, as it would be impossible to pass a large army save in detachments or divisions, from scarcity of water. This was the route pursued by Colonel Chesney in his expedition, and it was found by that officer quite practicable,—the delays he suffered having arisen chiefly from want of carriage and co-operation in

* Dr Clarke describes Nicosia, the capital of Cyprus, situated in the centre of the island, to possess the grandest fortifications he had ever seen, both on account of their extent and solidity.

the neighbouring authorities, consequent on the political state of the country at the time.

From a recent paper published in the fifth volume of the "Bombay Medical Society's Transactions," the following paragraphs, bearing directly and favourably on this subject, are extracted. The author, Mr J. C. Floyd, states—"Birjeck, in lat. 27° north, is a mean Turkish town, situated on the face of the hills on the left bank of the river, and fortified after the Saracenic style, though its ancient citadel is of Romish construction, and fast tottering to ruin. It contains 6000 inhabitants, chiefly Turks. Its bazaars are few, and far from being well supplied, considering its favourable situation, as being upon the great caravan roads from Aleppo, Antab, Diarbekir, Orfa, and Mosal, with all of which places it has a considerable transit trade. Birjeck was the place selected for the erection of the steamers of the first Euphrates expedition, and from which place they commenced the descent of this great river. It was not considered healthy at that time, as they lost many of their crews from fever when there; but that mortality with more truth might be attributed to their operations carried on in the marshy plains of Antioch, where they first became ill, and also to the privations and hardships which they had to undergo in prosecuting the arduous undertaking of transporting machinery thither. The climate of Birjeck, like all the northern parts of these rivers, comprises the extremes of heat and cold—the frost of winter continuing nearly three months, and followed by heavy rains. We see nothing in all this to render the place unhealthy; on the contrary, we believe it to be salubrious, and admirably adapted for a depot and commercial intercourse. Birjeck is distant 1100 miles from the Persian Gulf by river navigation; 90 miles from Aleppo by an excellent road; and 187 miles from Scanderoon—the nearest port of the Mediterranean, the latter part of this road being very hilly."

"The regions which we have now surveyed, lying along the banks of the Upper Euphrates, have been celebrated from the most remote ages, from the time when Babel's proud tower sought the skies, until the destruction of the Caliphate by the inundating hordes of Tartars under Hulicu, during which the rich capitals of Nineveh, Babylon, Celucia, and Etesiphon rose in succession to aggrandise themselves out of the ruins of its predecessor, and finally, by their growing wealth and power, becoming objects of ambition to Greece and Rome: they often drew together the well-disciplined legions of the West to contend on the plains of Mesopotamia for the empire of the East. But that which most commands our attention, as well as our admiration, are the military expeditions of Cyrus the younger, and the Emperor Julian, along the left bank of this river, as recorded by their respective historians, Zenophon and Ammianus Marcellinus. These, we regret that the nature of this report will not allow us to do more than notice: we can, however, add our unqualified belief in the geographical and other facts therein contained; and we may mention that, in case of any army

from the north invading this country at the present day, we believe that they would have to follow not only the very steps of their Greek and Roman predecessors, but would have also to take the same precautionary measures to secure supplies, and keep up the discipline of their troops; otherwise the attempt would prove futile in a country impoverished as this has been by the sword, and overrun by so many plundering tribes of Arabs, who, if they could not conquer, would always harass an army, as of old, and be ever ready to cut off its detached parties."

Birr (Berjick) is a small town, and Buckingham says it is the chief ford for caravans crossing the Euphrates. The river here is broad, rapid, and not always fordable: however, no invading army has ever crossed so high up, the march being along the right bank until close to the fertile plains of Assyria. Cyrus and Julian crossed at Circessum, where the river Chahoris falls into the Euphrates, which is probably the branch of the river above the modern Dahem. At this spot, the latter destroyed his bridge of boats, after crossing his army, to convince them that they must place their hopes of safety in the success of their arms. Here, also, a detachment of 4000 men was left, while the main body advanced in three separate columns, the baggage being secured between each; "but so open was the whole line of march that it occupied ten miles." Julian's success was complete, and Ammianus does not relate any extraordinary difficulties encountered. The upper part of the banks of the Euphrates are described as a barren desert, filled with clouds of sand, and subject to frequent gusts of wind, which, from their suddenness and violence, overthrew the soldiers' tents.* Xenophon likewise described the upper provinces of the Euphrates as equally barren with the deserts of Arabia; but neither that historian, nor others who relate the progress of armies by this route, mention difficulties a modern force could not easily overcome. Indeed, the greatest difficulty to be encountered is in the want of timber to build boats on the banks of the Euphrates—a species of poplar and the cypress being almost the only timber procurable; and as these trees never attain any great height, the requisite number of boats and rafts could not be obtained with facility. Moreover, the boats themselves are very fragile, being mere frame-work covered with hides, and coated with bitumen; so that flat-bottomed boats, of a construction stronger than those now in use, would be required for ordnance stores; but the native custom of floating rafts on blown-up hides would be sufficient, with the bitumen-covered boats, for the conveyance of provisions, &c.

Cultivation on the upper banks of the Euphrates and Tigris is far

* Mr Floyd states (*ut supra*)—"These squalls occur from May to September; they can never prove an obstacle to the navigation of this river, as the accident which occurred to the *Tigris* was owing chiefly to her peculiar construction, and being at the time top-heavy." The violence of these squalls we observed to pass off quickly, and do not deem them any obstacle.

from extensive. The grains are, therefore, not procurable in large quantities; but sheep, goats, &c., are—being the sole wealth of the Arab tribes—plentiful, and moderate in price; consequently an army would be scantily supplied from Birr to Anna, about which place the banks of the river begin to present a broad strip of alluvial soil, and much of its supplies on its march downward would depend on the friendship of the bordering Arab tribes, who, unless favourable to the army's passage, could, by withholding supplies and hovering about for the purposes of plunder and murder, cause infinite mischief. Their friendship, however, is to be purchased, and large bodies of their horse ought to be subsidised to act as irregulars during the march, which should be so timed that the army would reach Anna about the commencement of November, when the climate is delightful, and of a temperature that would allow troops to perform field operations during the day, and continue to do so with perfect impunity until the end of April.

From Hit, about one hundred miles below Anna, the Euphrates is navigable by boats of a large size to the sea. Here, the banks being alluvial, and covered with extensive grass lands, on which are countless herds of sheep and goats, as well as very considerable cultivation of wheat, with gardens containing abundance of fruit and vegetables,—no difficulty would be experienced in procuring food for a large army. Commissaries could previously gather every supply for the approaching force with ease, and the privations endured in the upper part of the river would soon be forgotten in the abundance of that of the lower.

A few days' halt at Anna, or Hit, would permit the army at once to proceed down the bank of the river to Bussorah, where troops can be embarked on board transports of 600 tons burden, or large steamers, and be conveyed either from thence to Bombay or the mouths of the Indus. From the latter position steamers ply to Sukkur, a distance of 400 miles, into the heart of this portion of Asia, from whence troops can proceed with ease to defend the Bolan defiles, or advance, if the season permitted, into Affghanistan and the Punjaub. The navigation of the river Indus to Sukkur by steam is easy, and we have already seen European troops conveyed from Tatta to Sukkur in the short space of ten days, while sailing boats have occupied a period of upwards of six weeks in making the distance between these towns. On the Indus the depots are very complete, and troops could dispense with much of their heavy armament, as guns and ordnance stores, which accompanied them down the Euphrates, and which might be left in depot at some strong and convenient spot in Mesopotamia.

We would not wish to underrate the difficulties of this undertaking. They are great, and the hardships to be endured* in the early part of

* As we are anxious on this point, that more recent authority than our own should be given, we again extract from Mr Floyd's paper on the medical statistics of the river Euphrates. "In conclusion, we may observe, that should ever this country become the theatre upon which the British army would have to engage, the fullest confidence might be placed in the salubrity of the climate and

the campaign would be both trying to the health and spirits of the troops; but every day's progress would render easier and easier the difficulties to be overcome. And relying on the ardour and discipline of British soldiers, it might confidently be anticipated that obstacles would be surmounted in reality far less than those achieved by the late armies marching from the plains of Scinde and Hindostan to the capital of the Affghan monarchy.

Minute details it is not our object to enter upon, nor could they be specified here without in a great measure losing sight of the main object of this sketch. The practicability of this route has, therefore, been reviewed only with the hope of leading to a more perfect knowledge of these portions of Asia during the present era, and of pointing out the possibility of advancing an army from Europe to India by a route which would afford the facilities of celerity, certainty, and that of conveying from Mesopotamia forces either into Central Asia by the river Indus, or by Bagdad to the capital of Persia. A measure, the importance of which would be absolutely necessary should the king of Persia again march on Khorasan, or attempt to co-operate with Russia in the invasion of India.

Should the force be required for this last object, it would have to cross the plain of Mesopotamia from Hit to Bagdad, a distance of about eighty miles, there to be freshly equipped for advancing on Teheran. The river Tigris being at all seasons a navigable river from its embouchure to Bagdad, the Indian Government, by means of its steamers, could easily throw a reinforcement of fresh troops, stores, &c., from the island of Karrack into that city, and always maintain the integrity of the conjoint army's rear; whilst Bagdad, from its size and wealth, could easily maintain the army, and with the assistance of the Turkish authorities furnish mules for its artillery and horses for its cavalry.

To speculate on the necessity for these movements is beyond our province; and in conclusion, we trust that the causes which existed for Great Britian being on the alert to guard her Indian possessions at all points no longer are necessary, and that the policy of the present day may preserve intact what is already subject to the rule of British India.

JAMES W. WINCHESTER.

31*st May* 1843.

Some Notes on Scinde. By Dr J. W. WINCHESTER.

(*Communicated by the Author.*)

Recent events having turned attention towards the Delta of the Indus, it may not be altogether uninteresting to describe the actual

if our report on the southern part of Mesopotamia be referred to, it will be seen that it also has a very good climate, if we except Bussorah and its vicinity."

territory now occupied by the British Government, and its limits. The chain of events which have led to this result, have yet to be fully developed, and so, likewise, have the benefits of its possession. Of the latter, a judgment may be formed from the nature of the soil and climate. These, and other accessories towards territorial wealth, will be found restricted, nor will the conquest be valuable until much has been accomplished by civilisation, agriculture, and the amelioration of the climate. But as a succinct rather than a speculative detail is here aimed at, we proceed at once to describe the general features of the country.

Scinde is bounded on the north partly by the Thurr or Great Desert, and Beloochistan. On the south its shores are watered by the Indian Ocean, whilst the Runn separates it, eastward from Cutch and the Hala mountains, westward from Muckran. The territory thus bounded occupies a space of 100,000 square miles, and extends from 23 to 29 degrees north latitude, and from 69 to 71 degrees east longitude. It is divided into two grand divisions, the northern and the southern; the former, termed "Sirra," extends from Bukhur to Halacandi, and the latter, "Lar," includes the distance from Sehewan to the ocean. The more modern designations of Upper and Lower Scinde in a great measure correspond with Sirra and Lar. However, the distinguishing feature of Scinde is the river Indus, which more properly may be said to divide it into two halves—that lying on the east bank being the largest. The whole tract of country through which this great river passes is singularly fertile, producing, with little labour, abundant crops of every description. Whilst regions of the greatest sterility encroach on all sides, far to the westward are the inhospitable mountains of Hala, and to the eastward the Thurr or Sandy Desert, and the Runn of Cutch—both districts of the most singular aspect, and void in a great measure of animal and vegetable productions. Scinde, from being thus bounded, and in possessing a delta, along with other assimilating characteristics, has been likened to Egypt—a country, in climate and the agricultural improvements of ages, in every respect superior.

In the vicinity of the Indus the general aspect of Scinde is flat, and, where not improved by tillage, is overrun by dense forests of babool, or extensive tracts of tamarisk jungle. Below the town of Tatta, on the right bank, low ranges of sandy and limestone hills occasionally occur, increasing in number, and gradually unite to form a low ridge of hills, which pursues a course parallel to the river, ultimately to join the mountains of Beloochistan, of which they often form spurs. Solitary limestone ridges occasionally exhibit themselves on the left bank, entirely unconnected with any larger or more extensive rocky formation. Confining, or rather bordering, the Indus, they remove much of the flatness so common in alluvial countries; but, destitute of vegetation, they add little to scenic variety.

The periodical rise of the Indus fertilises its banks, and annually increases the luxuriant growth of the tamarisk and babool trees; the

latter, chiefly occupying the banks of the river, form a highly picturesque feature in the landscape. Beyond the immediate banks the country is an extended alluvial plain, mostly from neglect and decay of old jungle, or desert tract, thinly sprinkled with tamarisk, stunted babool, and ziziphi, unless on spots irrigated by canals cut from the river, or from wells dug in the vicinity of villages. On the west bank the alluvium is soonest lost, and beyond its limits the soil becomes intermixed with pebbles and sandstone—the former composing the flat country bordering the hilly tracts of the latter, which, as already described, gradually join the mountains of Beloochistan, whose termination is at Cape Monze. Besides this range, west of the Indus, there are the Pubb range commencing beyond Cape Monze, and of which the mountain of that name is the highest point—and the Lakkan Hills, the More, the Undhar, and More Pubb, with the Julleel-lukki, Carra, and a number of detached hills, all barren save a few bushes of the euphorbia antiguorum, and with valleys in which no cultivation exists. The only objects of interest are occasional hot springs—The natural productions are alum and sulphur, and towards Cape Monze, where the surface is one heap of hills divided by ravines, lead, antimony, and copper. Betwixt these hills and the Indus, cultivation is limited by the fertilising effects of the inundation.

East of the Indus, as already remarked, there are only isolated ranges of hills, and the country generally possesses its alluvial character until near the Thurr and the vicinity of the Runn of Cutch, when it becomes a flat sandy desert: to the eye it is a perfect level, often richly cultivated—jowarree being the most common grain, although wheat, barley, bajree, and rice are procurable in some abundance near every large village. The country is much intersected by broad and deep canals, rendering transit through this part of Scinde tedious, many of the canals being so deep as to require boats to ferry over men and animals: others have temporary bridges for this purpose, whilst the roads themselves are such as entirely to prohibit the use of wheeled carriages in Lower as well as in Upper Scinde. In fact, they are merely footpaths, better being unnecessary for the passage of camels, horses, bullocks, and asses, the animals of burden employed throughout Scinde. On these roads water is never wanting; but permanent villages being rare, provision for any large kaffila or body of troops is with difficulty obtained.

The Thurr, or great Indian desert, which adjoins Scinde from the river Loonee, its east border, to Scinde, its west, and from the Runn of Cutch to the south, to within sixty miles of Jeysulmere, on the north, and stated by Herodotus to be the boundary of India, merits some description, as does the Runn of Cutch—both being appendages of Scinde. The Thurr is an extensive sandy tract, destitute of trees; but abounding in forage and jungle, babool, peloo, kureer, and milk-bush. It rises from the Runn and the plains of Scinde in bold relief, with a demarcation as distinct as if it arose from the sea. Its features are

peculiar, and throughout its whole extent retain a uniform character, being composed of innumerable ridges of loose sand, of a bright yellow colour, in height varying from fifty to two hundred yards—intersecting each other almost every mile, so as constantly to form basins or reservoirs from whence there is no evident outlet,—all rain being absorbed in the light sand of the soil, and no stream or watercourse being anywhere observable. These ranges of hills thus confusedly heaped together, preserve a general direction, running from N.E. to S.W. Northward they are more defined and open than to the south, where they are denser and more crowded on one another. In a desert of this description water is scarce, and, when found, uniformly brackish or salt. Where skirted by the Runn, water is found a few feet from the surface; but receding northward, water is only procurable at a depth of two or three hundred feet—at first fresh, imperceptibly becoming brackish, yet almost always affording a certain supply, increased after heavy rain. As a road, this desert is impracticable to every animal except the camel. Its inhabitants are few, and lead nomade lives,—moving with their flocks and herds from spot to spot, as water and forage fail. They are chiefly Mussulmans, with here and there a Hiñdoo, who purchase and export ghee, the sole product of this tract, otherwise in a great measure a barren and unproductive soil, ill capable of supporting, even for a time, any addition to the few miserable inhabitants it possesses. Yet in doing this it is less a desert than the Runn of Cutch, which it borders. This singular and unparalleled tract occupies 7000 square miles, extending from the river Indus to Guzerat, nearly two hundred miles in length, with an average breadth of thirty miles, and neither yields fresh-water nor life to the most stunted vegetable. A perfectly level tract, its soil, a mixture of mud, sand, and clay, is covered with a thick encrustation of salt during the dry season, and in the monsoon by water, possessing in neither condition any of the attributes of a marsh. Its banks are in many places very fertile, often sandy, and in some places rich alluvian. On these, water of excellent quality is found within a few feet of the surface, and tanks of rain-water, within two hundred yards from the Runn itself, retain their sweetness for many months. In appearance the Runn is uniform, and is somewhat below the level of the surrounding countries. This, and its being flooded during the monsoon by the water of the ocean, driven in by the violence of the south-west winds from the Gulf of Cutch, and the creek or inlet of the sea leading up to the Koree branch of the Indus, as well as the Loonee river falling into its upper or northern portion, render it highly probable that this was formerly a dried-up sea or inland lake. Native tradition tends to this belief; but the entire absence of all marine remains either on the Runn itself or along its shores, is strong proof against this popular belief. Indeed, from the changes exhibited on its surface after the great earthquake of 1819, it might readily be imagined that on a former convulsion, some huge change or uprising of the earth had occurred to alter the course of an eastern branch of the river Indus, disemboguing itself

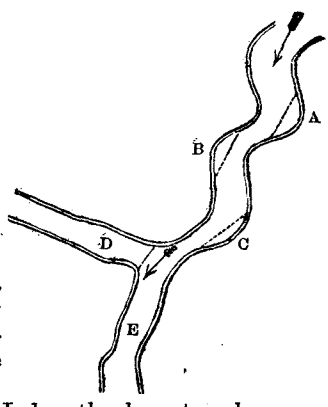
towards Luckput Bunder, and thus left a vast space of alluvial soil a barren waste, which, from the nature of such soils, aided by an annual influx from the sea, speedily assumed its present highly desolate and saline aspect. Portions more elevated than the rest—as the Bunnee and the other islands—escaping the general catastrophe, still exhibit the fertile soil its banks have: while on these (in a great measure) and along the banks of the Runn, the water is drinkable. Further, it may be stated, in support of this opinion, that the level of the Runn is higher than that of the sea; and that the traditions of natives may have their origin more from this vast flat being annually inundated on the rise of the Indus, and being called, as the river Indus is still when thus swollen, the "Duryea" or "Sea of Scinde." But the limits of this article do not permit more than the expression of this theory, which has for its support many facts.

Having noticed in an extremely cursory manner the general aspect and boundaries of Scinde, with the exception of those to the north, it remains to be stated, that a spur from the Great Soliman range of mountains, forming the Murree and Bhoogtie hills, bound Cutchee, a province bordering on Upper Scinde to the north-east and east, in a north-easterly and southerly direction. This range is rugged and barren, affording only brackish water in pools, the coarser grapes and tamarisk jungle, with a scanty cultivation at their bases. Naturally they produce sulphur, alum, and saltpetre, but in quantities too small to be rendered profitable. From the foot of these hills the country is sandy and barren, with little variation until in the vicinity of the river Indus, when the soil becomes fertile, and relieved from its flatness by the rocky banks of the river and occasional date groves. Without, however, the influence of the irrigating powers of the Indus, the soil again becomes hard and sandy, sprinkled with the camel-thorn and stunted shrubs. Dry and cracked from the heat of the sun, its loosed sand is raised, by the constantly prevailing westerly winds, into little hillocks, from twenty to thirty feet high, which gradually assume the appearance of desert, running imperceptibly into the Thurr.

Within these limits, the vast territory occupied by the Delta of the Indus—extending from the rocky shores of Cutch, at Luckput Bunder, to Cape Monze—presents a very uniform formation, being composed of the richest alluvium, mingled towards the north with fine sand, gravel, calcareous deposit, and close to the foot of the rocky ranges with masses of lime and sandstone, in which much recent marine deposit is found. The greater portion of this soil has been reclaimed from the ocean, and the annual deposit of detritus may be estimated at least three inches, as in every similar soil equal uniformity prevails, with the exception of a subsidence of several feet, consequent on an earthquake, (1819,) which has given to the lower strata of the alluvial deposit between Narrunseer and Luckput an inclination varying from 25 to 30 degrees parallel. A line of country from east to west, upwards of fifty miles in length, was by the same earthquake simultaneously elevated.

This region is known by the name of Ullah (God's) Bund. It varies in its breadth; but in some places exceeds sixteen miles, whilst its height is not more than ten feet above the level of the Delta. In length it extends from the island of Peecham, on the Runn of Cutch, to Gharee, a small village within seven miles of the creek or arm of the sea which runs up from Luckput Bunder—and consequent on the elevation of the Ullah Bund, possesses at high tide considerable depth of water.

The valley of the Indus and its Delta maintain similar characteristics. Receding from the embouchure of the river, by the large quantity of felspar and mica deposit the soil is rendered loose and less adapted for confining the stream; in some places so much so, that the river extends over a large surface, and the adjoining country is as barren as the sea-shore. The substratum of plastic clay and sand on which the upper soil rests is at a great depth, and to this cause, as well as the loose nature of its banks, are the sudden changes in the channel of the Indus to be ascribed. These the natives can tell by observing the manner in which old channels are blocked up; as, for instance, if the force of the current destroying the side A forms a bank which throws the current to B, the same effect causes it to change to C and D, which branch is thus blocked up, and the new channel E in consequence formed. Such causes as these are great hindrances to any but native navigation, uniformly tedious, and the mouths of the Indus have no harbours.



Beyond the Delta and valley of the Indus, the lowest rocky ranges, or those towards the sea, are entirely composed of sandstone superimposed on an argillaceous base. Both abound with marine deposit, and the former with carbonate of iron in sufficient proportion to give the rock a dark brown colour, varying it with a bright red ochre streak. The bases of these hills are so recent as to have no distinct stratification, and the superincumbent sandstone is huge flat masses capping the summits and resting on their sides. Their sandstone is tertiary; generally soft and friable, sometimes hardened by a mixture of quartzose matter, and abounding with iron either in the form of the carbonate or spicular ore. Their height seldom exceeds 200 feet, and they join imperceptibly with the more inland ranges. These, resting on similar bases, are composed of a harder and older tertiary formation of sandstone and limestone, in which marine fossils are very abundant. In describing the general features of Scinde, they have been alluded to by name, as well as their containing, towards Cape Monze, sulphur, lead,

antimony, alum, and copper, but in quantities so disproportionate to the labour required to work them, as to be very far from valuable productions. As these hills extend inland, they become united with the Hala and Lukki ranges—secondary ranges of a uniform appearance, which they preserve until they join the mountains of Beloochistan.

Bordering chiefly the west bank, and in some degree confining the Indus, several low ranges of hills rise abruptly from the soil. Without any indication of the stone on the plain below, they form a singular feature. Their structure is conglomerated and brecchiated masses of limestone resting on a calcareous base, which forms a broad line or belt along the alluvial valley of the Indus. Much mixed with fossil shells, their structure, as it first shows itself, is a friable calcareous sandstone, disappearing in its elevation in an aggregate of rounded and angular masses of cream-coloured limestone. Agglutinated together into huge blocks, without any intermediate basis, often a softer cretaceous stone is observed of a similar construction, in which no fossil remains are found, although they exist in considerable quantity in the harder limestone brecchia, which also contains numerous rounded concrete grains of quartz. On the right bank, and occasionally on the left, are several solitary conical hills of a white cretaceous stone, which appear as if they, along with the ranges of hills bordering the Indus, were clysmic accumulations, not belonging to the effects of one general flood, but of a very extensive local cataclysm. Many of these masses exhibit considerable marks of friction, others few or none, marking the respective distances they have travelled; whilst at their bases marine and fluviatile shells, varieties of genera at present existing, are found buried in the earth little changed, except in colour, and in being extremely fragile.

Throughout Scinde the soil is generally fertile; but in many places the rapid decay of vegetable matter on its surface renders it a desert. Other parts are so far removed from the vivifying influence of the inundation, that they speedily, when neglected, become little else than a waste, or a jungle of tamarisk; when in the interior and in the Delta, of mangrove. All that portion of Scinde which borders on the rocky inhospitable mountains to the westward, and the equally barren sandy plains of the great and little deserts to the eastward, are tracts on which only the hardiest vegetable productions can exist. Beyond the influence of the Indus, its branches, and numerous canals, guided only to fertilise certain districts, the country has no fresh springs, and the torrents from the mountains are so quickly swallowed up in their sandy beds, that they cannot be said to add even to the fruitfulness of their immediate banks. Few wells are employed for the purposes of irrigation; and as is the case on the banks of the Ptolemaid, it may be truly said of Scinde, that on its river the resources of the country alone depend. The branches of the Indus in Scinde are—the Narrah, which leaves the main stream twenty-four miles above Rorce, pursuing the direction

towards Omerkote, which it nearly approaches when flooded. Its channel is obstructed by numerous bunds or embankments, the largest of which is termed Annee Bund, from whence cultivation is extended, and numerous fish caught. Another branch, called the Narral, leaves the Indus below Bukkur, near Larkhanah, and in its passage to rejoin the main stream again, forms a clear small lake, called Munchur, issuing from which it assumes the name of Arul; in breadth, it seldom exceeds one hundred yards, and is navigable only during the inundation. Its banks are very level, and, from being extensively flooded, form good grass land. The next branch is the Fullailee, given off twelve miles above Hydrabad, and which, passing close under that town, proceeds in a south-westerly direction, forming a course almost parallel to the branch designated Pinyaree, which separates itself from the parent river about three miles below Jerruck. Both these branches are of inconsiderable size, unless during June, July, and August, the months of the inundation: even then their navigation is uncertain, and only the smallest boats ply on them. Their chief use is in fertilising the districts they pass through, and each has large bunds thrown up, which, arresting the passage of their waters, scatter them over and irrigate a vast space. This, by the immense annual deposit of sediment, has been found to gradually raise the level of the country surrounding these bunds, and to contract the vivifying influence of these streams. The last branch of the Indus marks the commencement of the Delta, and is called the Buggar, or western branch of the Indus. Its course commences five miles below Tatta, and after a tortuous passage disembogues itself into the ocean a few miles east of Kurrachee. Like the other branches of the Indus, it is dependent on the flooding of the main river for its waters, each consisting during the remainder of the year of merely a series of detached pools. West of the Indus, issuing from the rocky ridges, are several mountain torrents distinguished by name, viz., the Mulleeree, Kurchee, Liaree, Kowranee, Rooah, Pepree Gorban, Muraie, Pokun, Warkee, Kayjooree, and Dombee. They are dry during the greater part of the year; but by excavating their beds a few feet, water is uniformly and abundantly found, which could be raised by a double set of Persian wheels in sufficient quantities for irrigating purposes. There are two other streams, generally called rivers, besides these smaller ones, on the west of the Indus, named the Hubb and the Burran. The former has a course of only fourteen and a half miles, neither is it a running stream, unless after heavy rain; at other times it consists of merely detached pools, abounding with fish and alligators. It is never entirely dry, and its banks are the principal resort of the Beloochees and Loomrees. The Burran, which has its source from a hill called Kirtee, north-west of Hunelanee sixty miles, forms a junction with the Indus a quarter of a mile below Kotree. In character it much resembles the Hubb, but generally contains a larger quantity of water.

The climate of Scinde has two great periodical variations—the hot

and cold season. In the former the heat is excessive, the thermometer often rising in the shade above 120° F., and averaging in the sun above 140° F. This great degree of heat lasts from the end of March till the commencement of August, and is of a dry, parching nature, utterly exhausting everything possessed of vegetable life, save what is freely and duly irrigated. Indeed, during this period, the whole of Scinde, except the green forests of babool, skirting the banks of the river Indus, presents a most arid appearance, relieved barely by the annual rise of the river, laying much of the country on either bank under water, which in September and October gradually declines and dries up, leaving, but in those spots where art has exercised cultivation, a dry and cracked soil. The setting in of the cold and violent northerly winds of November, prevents all vegetation besides a few grapes, or stunted tamarisk and babool bushes. Frosts and blighting dews at this season, also tend to destroy a great portion of what would otherwise have been germs of much vegetable life, which if they chance to escape, rise only to be annihilated by the heats of April and May, or swallowed up in the clouds of dust; the westerly winds of these months blow and accumulate against every obstacle. Under such circumstances, it will not be expected that Scinde should afford much interest to the botanical inquirer; for, beyond the necessaries of life, which, notwithstanding the little care bestowed on their cultivation, grow luxuriantly, the whole surface of the country is very barren of vegetation. In the beds, and on the banks of the watercourses, and the lower spots where humidity is longest retained, several shrubs, as the tamarisk, the capar plant, the accacias, mimosas, and capias, flourish with some degree of exuberance. Towards the Delta, where the soil is saline and very moist, the mangrove and salsolas abound. These, with the exception of the wooded grounds along the banks of the Indus, its branches and large canals, alone exhibit vegetable life in activity. They occupy nearly one-fourth of the richest part of Scinde, and their trees are the accacia and mimosa, chiefly the mimosa aggrestis, which grow to an immense height and size. Besides the mimosas and accacias, the mangoe tree, the jamboo, neem, banyan, and, in Upper Scinde, the date tree, are met with in the neighbourhood of the larger villages, along the banks of the Fullailie; they form magnificent groves, beneath which are gardens filled with pomegranate, lime, apple, orange, jujub, and mulberry trees. Beyond these spots, in the more sandy districts are the peloo, the camel's chief forage, euphorbias, the caper bush, the tamarisk, and occasionally the oleander; most of the irriguious or cultivated plants are exotic; and Scinde produces few noxious herbs. The grapes are limited in number, and those growing on the soil away from the Indus are parched, and afford little nourishment, unless their roots are dug up; but those bordering the river flourish most luxuriantly. The reed of the Delta is often fifteen and twenty feet in height, and the typlea elephantina, most valuable from its roots binding the soil of the banks together, and preventing the cor-

roding influence of the current, may be said to be the most gigantic of its kind.

Animal life is as scanty as the nakedness of the country indicates. It has no peculiarities. The camel, the horse, and the ass, along with the bullock, are the common animals of burden. The Indus teems with fish, of which the most plentiful and most prized is the pulwa or sable fish, (one of the cyprinidæ.) The long-snouted Indian gavial abounds in the Delta, and is occasionally seen higher up. Otters and badgers are plentiful on the banks above Larkanna and Sukkur; numerous water snakes exist in the Indus and its branches; but the jungles are very free from those of the venomous sort.

It is only within the last century that Scinde was in any way distinguished among the nations of Asia. At first tributary to the emperors of Delhi, it fell under the Affghan monarchy during the reign of Timour. Then it was ruled by a prince of the tribe of the Calloras, named Abdool Nubbee, who had rendered himself obnoxious to the Talpoors and other tribes bordering on Scinde. The Talpoor chief, Meer Futti Ali, expelled the Calloras, and assumed the government in conjunction with his three brothers, under the title of Ameers, or lords of Scinde, whose descendants, until lately, possessed the country among themselves in unequal shares. Timour Shah made some faint efforts to restore the government into the hands of the Callora chief; but these proving unavailing, he bestowed on Abdool Nubbee the government of Lera, and formally invested Futti Ali Khan as ruler of Scinde,—since when it has been considered tributary to the monarchs of Cabool, who, unless backed by a large army, have never received any tribute. By a course of events too recent to require detail, this country has now become a portion of British India. The government of Scinde, like that of the other adjoining kingdoms, was despotic, the ruler maintaining absolute power. On the expulsion, however, of the Calloras, and the usurpation of the chief of the Talpoors, the government of Scinde became an anomaly amongst nations. Equal power, and in a great measure equal right of sovereignty being upheld, not only by Futti Ali Khan, but by his three brothers: a sway which has since continued, and been the means of deteriorating the country much, for its revenues are not one-half what they were during the reign of the Calloras, when the whole country was subject to one rule.* Unequally divided between the late chiefs, who had each absolute power over his own share—Scinde scarcely possessed any government. In fact, the Ameers were little else than the landed proprietors of the soil, who in virtue of a sort of hereditary right, took rent for their lands in money and kind. Their influence did not extend beyond the limits of their territories, and these being divided among three different branches of the Talpoor tribe, all independent of

* This statement is given on the authority of Mr N. Crow, many years Commercial Resident in Scinde, and is similar to that made by us, in the article on Scinde, in Rushton, erronously attributed to another pen.

each other, the administration of public affairs in all their details was most complicated. The Hydrabad Talpoor family, always the most prominent, in a great measure threw into the shade that of Meerpoor and Khyrpoor—the latter of whom possessed the northern portion of Scinde, while the former held the country round Meerpoor S.E. of Hydrabad—but each striving to be first, and all constantly engaged in family disputes, their territories were always in an unsettled condition. Throughout the country there was no police. All the large towns and surrounding districts were under the control of governors, whose chief care was to collect the revenue, and to settle, without reference to higher authority, all disputes.

The revenues of Scinde arise principally from the land tax, export and import duties, transit and other duties on certain produce, such as the fisheries on the Indus, the pearl fishery in the Gharrah creek, &c. —the former, or the tax on the mohamias or fishermen on the river, being a considerable source of revenue, though generally paid in kind. The land or soil collection is also paid in kind, and the excessive taxation was such as to swallow up all spirit of enterprise. Seldom more than one-fourth of the profits of the fields were realised by the cultivators—the remaining three-fourths being seized on by the different agents employed in the collection of revenue. Indeed, so extortionate were these agents, and so evident was it that the idle alone reaped the benefit of the labour of the ryot, that it is not surprising the face of the greater portion of Scinde presents a desolate aspect—the natural consequence of ruinous taxation and ill-regulated authority. Considering that a great portion of the revenues of Scinde are paid in kind, and that it was a custom of the Ameers or holders of the soil to realise into money by the sale of grain, fish, &c., their income, or in other words, that they were the corn merchants of the country, it is a matter of some difficulty to estimate the actual amount realised. That of the Hydrabad family may be grossly stated to have been thirty-three lacs annually—that of Meerpoor, six lacs—and that of Khyrpoor, twelve lacs—a total revenue, exclusive in a great measure of the charges of collection, of fifty-one lacs, from which all the charges of government had to be defrayed.

"When," says a modern geographer, "high cultivation has been established, it is scarcely eradicated by long periods of anarchy and misgovernment." Scinde, with advantages equal to the alluvial plains of the Delta of Egypt, the Ganges, and the great rivers of Mesopotamia, has never had its full resources developed. Its soil is rich and traversed by a great river and its branches. From these, innumerable canals might be made to cross, and to render the whole country fruitful. Yet no effort seems ever to have been made to obtain from Scinde anything more than a supply of grain for its own, and the wants of the neighbouring sterile tracks. No remains of great canals, such as exist along the banks of the Nile, the Euphrates, and the Tigris, which ages of anarchy and oppression have not effaced, are seen throughout

Scinde. Neither are there any proofs extant to show that her fertile sources have ever been extracted. The want of care, and little skill exhibited in cultivation, as it is now carried on, tell but too truly that it is not the political degradation of a century, but of ages that has prevented this country's resources being unfolded. It is, therefore, a new surface, only requiring man's intelligence and labour to bring forth its riches. Rice, wheat, barley, jowaree, bajree, numerous other grains, sugar-cane, cotton, and indigo flourish, and the three last are capable of great improvement. The sugar-cane grows to an enormous size on the Delta, and along the river's banks, bnt it is coarse, and ought to be superseded by the introduction of the Mauritius and other finer canes. Indigo and cotton are cultivated in the same field, in small qnantities for native consumption. In quality both are very superior. The indigo forms a thick bush of about five feet in height, planted in regular rows, between which, after the crop has been cut, cotton is planted, and thus protected from the northerly winds of the cold season.

All agriculture is dependent on irrigation, Scinde being without the influence of the periodical rains of India. The annual inundation is the great source from whence water is derived. Early in May the swell of the Indus points out the necessity for deepening and cleaning out the various canals. Towards the middle of June there is a sufficiency of water for preparing the soil, and irrigating the crops, which ripen and are cut down in October. Irrigation is carried on by means of the Persian wheel, worked either by camels or oxen. Those lands set aside for the cultivation of wheat and barley, which are sown in October and reaped in March, are inundated by the waters of the canals being allowed to spread over the fields, or by the bunds or dams of the branches of the Indus forcing their streams upwards over the surrounding country. The Delta and the east bank of the Indus are the richest and most alluvial portions of Scinde. Their soil has more capabilities, and is better watered than that on the right bank, which from Kurrachee to Sehewan is generally a light clay, in some places mixed with a good deal of sand, and in other parts with pebbles and sandstone. Cultivation, moreover, with the exception of the vicinity of the villages of Gooja and Gharrah, is confined to the villages bordering the Indus, which have canals cut to them, and is far from extensive. The more distant and rocky regions are occupied by nomade races, whose dwellings consist of reed huts, made of a sort of matting termed "Puk," which is easily rolled up and carried from one encampment to another. Camels, goats, sheep, and buffaloes are their sole wealth. They seldom eat grain, cultivation being unknown amongst them; but supply its place by a wild berry called "beir," which when dried they mix with some milk. In habits they are quiet and inoffensive. Their numbers do not exceed five thousand, and their sole occupation is making coarse woollen cloths. Above Sehewan the soil is more fertile, and from that town and Lark-

anna, bajree, wheat, and rice are annually conveyed down the Indus in large quantities.

Encroached on by the great and little deserts, the alluvian of the left bank becomes lost in a sandy soil; previous to this, a broad, continuous strip of rich earth, from whence most abundant crops can be reaped, extends along the Indus. Canals traverse it in every direction, and that which goes to Meerpoor is upwards of sixty miles in length, fertilising the whole surface along its course. The Fullailee and the Pingaree render fruitful the lower portions of this bank, and the Delta is all either cultivated land, or extensive grass plains, on which are large herds of buffaloes, from whose milk ghee is formed and largely exported.

These are the main agricultural features of Scinde. How much they are capable of improvement is very obvious, when the former flourishing condition of the country is contrasted with its present state. Nor must it be omitted as a consideration for even greater benefits than were formerly obtained, being expected in the altered condition of the government, and the improvements of modern husbandry, seconded by judicious expenditure.

Scinde owns vast resources in the river Indus. Navigable to its own boats and flat-bottomed steamers at all seasons, it is the high road of the country; its fisheries afford food to thousands, and the wood on its banks is valuable for boat-building, and many other equally useful purposes. Lac is abundantly produced from the babool tree, and largely exported. Cotton and silk are wrought up into the texture called "longees," and the chintzes of Tatta; the carpets of Sehewan and Shikarpoor are superior; other manufactures are very little known: but, shut up as Scinde has been from all commercial intercourse during the past century, it is not to be wondered that her rescources are so limited, or her foreign trade confined to a few of the most pressing necessities of life.

Scinde is a thinly peopled country; the whole population does not exceed one million, and is divided into three distinct classes,—the aboriginal, the Belooch, and the Hindoo. In all the large towns Hindoos preponderate; but in the smaller villages and agricultural districts Scindees and Beloochees form the bulk of the people. The Hindoos amount to about 200,000; the aborigines to 500,000; and the Beloochees to 300,000. The first are occupied entirely in trade, and in religion, as well as in habits, are perfectly distinct from the two latter, who are Mussulmans; both are agriculturalists, the Beloochee as master and the Scindian as servant; yet there are many villages throughout Scinde wholly composed of its own natives, and others which are termed Belooch villages from being the sole property of that tribe. The aborigines are the less fixed people, being scattered over the whole country, whilst many thousands lead nomade lives, moving their villages with the rise and fall of the river Indus. The boatmen or moonas, and fishermen on the river, as well as those who live by

the same means on the banks of the different Bunds, with the inhabitants of the Shurs and bordering deserts, are of the same class. Divided in clans, the Beloochees located in Scinde maintained a degree of wild independence, and their feudal services were only rendered on pressing exigencies. They are a boasting, indolent race, and have become in a great measure identified with the native of Scinde. A quotation from so ancient an author as Hippocrates will, with the exception of the mountainous tribes, fully describe the general appearance and character of both races :—"You will almost always find the forms of men and the character of the place corresponding, for where the soil is rich, and soft, and wet, and of uniform temperature, the people are gross, lymphatic, and of relaxed joints, intolerant of toil, and cowards: indolent and sleepy, they are neither keen nor subtile, but dull in the arts."

Mohammedan is the faith of the Beloochees and Scindians, which they exercise with bigotry and intolerance towards others, yet dispense with much of what is real in their religion or its ceremonies. There are few public mosques, and Hindoos have been denied the privilege of building temples. Syuds, Sanits, and Fakirs abound,—the former are well content with their enams or grants of land, and the latter are wandering sects, whose only end is begging.

There are no colleges, libraries, or public schools in Scinde; but the higher classes are commonly well versed in Persian literature, and can read and write their own dialect, which is a mixture of Sanscrit, Punjaubbee, Pooshtoo, and Persian. Hindoos, however, are universally employed as men of business, and their extortionate conduct added much to the Ryot's misery. Although thus trusted, their influence with their masters was not great; and the principles of justice, as laid down in the Mohammedan law in regard to infidels, was rigidly adhered to on all occasions towards the Hindoo, who, either in seeking redress or defending himself from oppression, suffered.

The native of Scinde labours for his daily food, and oppression has made him temperate. He is lazy when he finds opportunity, and indulges in tobacco, but rarely in bang or spirits. On the other hand, the Belooch is indolent and debauched,—one half of the morning is spent in preparing bang, which intoxicates till the afternoon, when the use of opium and tobacco varies his debaucheries. Among the higher classes these indulgences are seldom resorted to, and if so, sparingly and in secret; they are not, however, without many of the degrading vices of the East. The Hindoo wants the peculiar refinement and polished manner of his race, degraded in their religion,—and, as a people, their feasts are marked by the grossest drunkenness; and their whole conduct is opposite to that which distinguishes them in Hindostan. The dress of the Scindian consists of a wide pair of trousers, an outer garment which covers their whole person, and a small round hat; they are always armed either with a sword or matchlock, and a knife stuck in their girdle, but their quarrels seldom end in the use of

either. The women of the poorer classes go about and add their labour to that of their husbands: but the richer have all the rigours of Oriental despotism exercised towards them.

It would exceed the limits assigned were the local geography of Scinde fully entered upon. There is, as yet, little to interest, and its statistics, with improved means, have still to be developed.

Scinde possesses only two seaports, one on the Hujamree branch of the Indus, a few miles from its embouchure, and the other at its northern extremity. The former, Vikkur, is merely a small village, any permanent town being useless, from the changeable nature of the main channel of the river. Such as it is, it enjoys the trade of the Delta and the Indus. Boats drawing ten to twelve feet of water can cross the bar of the Hujamree; but those exceeding in draught six feet can barely ascend to Vikkur Bunder at the highest tides. From April till the end of October, the navigation of the mouth of the Indus is closed by the strong south-westerly winds which during that period prevail.

Kurrachee is a town of considerable note, and is situated at the head of a creek, distant from the sea four miles. A harbour at its entrance, protected by a high headland, affords safe anchorage, at all seasons, to vessels of 300 tons, from whence large boats can pass up close to the town, which is built on a slight rising ground, and surrounded by a mud wall unfit for defence. Kurrachee has extensive bazaars, but its streets are narrow and filthy. Its inhabitants amount to 12,000; and the port, carrying on an extensive trade with India, Arabia, and Persia, yields a large annual revenue. East of Kurrachee is the town of Tatta; formerly it was the capital of Scinde, but now a heap of mud ruins, of which every town in Scinde is built; it scarcely contains 8000 souls; once it commanded all the traffic of the Indus, from which it is distant four miles—now it has no commerce. Hydrabad, on the east bank of the Indus, is the most important and populous place in the interior of Scinde. It contains close upon 30,000 inhabitants, and the surrounding country is populous and well watered. East from Hydrabad about fifty miles lies Meerpore, a town with a mud fort in its centre, and a population of not more than 4000. Beyond this latter place, in the desert, are Islamkote and Omerkote; the former, a celebrated town and port, used to be considered the stronghold of the Ameers of Scinde. The town, however, is small, and does not contain above 400 souls, and is apparently of no actual importance. Its trade is limited to that of the Thurr, and the arrival of an occasional kaffila from Parhhur. The fort is built of burnt brick, and, if properly garrisoned, is capable of being defended. In form it is square, with bastions at each angle thirty-six feet high, and a gateway to the south-east. Islamkote was the usual deposit for revenue collected in kind from the neighbouring districts of the Thurr. Omerkote, long the place of contention between the Rajahs of Joudpore and the Lords of Scinde, is situated on the western side of the Thurr,

on a low range of hills overlooking the level plains of Scinde and the Thurr. The fort is built of mud, and as a place of defence is contemptible. In form it is oblong, (150 by 80 yards,) with bastions. Its walls are twenty feet in height, and surrounded by the remains of a ditch. Inside this fort is a separate keep or tower, of no use, and several wells; but the chief supply of water is derived from a large tank outside, whose mud is also used in repairing the walls. Omerkote, as the birthplace of Ackbar, derives some consequence, and it is the largest town in the Thurr, carrying on considerable trade as the central point in the desert. Its inhabitants are chiefly Rajpoots, and do not exceed in numbers 2000. Khyrpoor is a very miserable looking town, with the chief's residence in the centre of the bazaar, and a population of 18,000 souls. On the east of the Indus, Shikarpore is the largest and most important place; its trade is extensive, being the emporium of the countries beyond Scinde, and the number of its inhabitants exceeds 25,000. Larkannah and Sehewan are less populous towns, their population averaging 12,000, but, as the capitals of very fertile districts, possess considerable trade and wealth.

JAMES W. WINCHESTER.

April 1843.

A Translation of the Gwalior Nameh, or History of Gwalior, from the Persian Manuscript. Translated at the request of Major T. B. JERVIS, F.R.S.

Glory be to that Creator who has formed of this earthen castle an impregnable fortress, and has constructed the vast race of mankind like strong towers, and having bound down the four opponent elements, has created him in multitudes, and appointed him lord and master of this earth, and given him undisputed power over all the living creatures of the land or water: all living creatures must obey him; he is the victorious lord over all. The praise of the prince of God's messengers, the last of the prophets.—Praise and obeisance is due to him who with the key of revelation has opened many towers full of ignorance and infidelity, who by the light and wisdom of truth has enlightened the eyes of the world. The gates of the beginning and end were opened by this imperishable, the last of the prophets, whose greatness and splendour will continue till the last day, until the mighty highway of religion remains safe and secure from the attacks of opposing enemies. The peace of God be upon him.

Let us relate a brief history of the ancient inhabitants of Hindoostan, who built and constructed the castle of Gwalior and held possession of it. The climate of Gwalior was finer than that of any other province in India; travellers who have traversed the whole globe have never seen so nice a spot. On this lofty fortress still exist palaces

and halls built by the greatest rajahs and sultans. We will now relate how this castle was first founded, the history of its founder, and those who commanded and ruled in it. The old Indian historians, the brahmins, state that the name of this mountain on which the castle is built is Koomunt; all round it lions, tigers, and all kinds of creeping animals were collected, for men seldom passed through its wild jungles; but a reverend old monk, by name Gwalior, who feared his God, and had separated from mankind, had retired to this secluded spot for the enjoyment of rest, and was content to live on herbs and vegetables. Three hundred and thirty-two years had passed since the time of Bekermajeet, and the castle had been founded 315 years before the Hegira, by a landholder named Sooruj Seen Kuchwasa, who lived at Loosinan in the province of Chenaver: he one day in a hunting excursion passed the foot of that mountain, and whilst ascending it in chase of the deer was honoured with a sight of the old monk, (whose name in the Hindu language is Seddee Joogy.) After the usual salutations, from excessive thirst he begged of the old monk to show him some water; the old man pointed at a fount flowing from the root of a small tree, and giving a handkerchief to Sooruj Seen, he said, "Fill it, and bring it to me." Sooruj Seen then went to the fount, and having first washed his feet he filled the handkerchief, and on his return presented it with the greatest respect to the old man. It is said the water did not drop through the towel, but remained firmly enclosed inside it. The old man drank a little and gave the rest to Sooruj Seen, who also drank sufficiently to allay his thirst. The old man having heard that Sooruj Seen had been suffering from the leprosy for ten years, inquired whether this was true. Sooruj Seen then stated the nature of his disease; the old man told him to come here on the Monday morning, and wash in the fount: that if he did so he would surely recover. He returned the next day early in the morning, and after paying his respects to the old monk, went to the fount and bathed in it with all his family. He instantly recovered, and at that very hour distributed presents to the Brahmins and returned thanks to the mighty God, and fell at the feet of the dervish with respect and gratitude. The old man was pleased at his conduct, and advised him to convert the fount into a large tank, and to build on this mountain a strong castle. Sooruj Seen consented to do so, but he said, "I am a poor and penniless Rajpoot; how can I entertain in my breast such grand ideas?" The dervish had a bag, which in the language of their sect is called ambooh, in which he kept a store of alchemical preparations which he used when in need of them; this bag he presented to Sooruj Seen, and said, "Take out of this bag as much gold as you require, and spend it as you like." He also prayed for Sooruj Seen, that by the will of the Almighty he should be the rajah of this castle, and he should possess the whole country: he also changed his name to Sooruj Pal, and prophesied that his children and

descendants should keep possession of the country, and as long as his descendants kept the title of Pal attached to their names, the kingdom and power would remain in the tribe; but if ever they dropped this title the kingdom and power would be taken from them. After saying this, and placing his hand on Sooruj Seen's forehead, he vanished from their sight. The rajah's power rapidly increased, and in a short time he finished building the castle, and founded many palaces: the fountain of Sooruj Kand was built by him. We have now related how Gwalior and Koobahil were raised. The rajah held the dominion and power for thirty-six years, and overcame most of the landholders and princes, and brought under his sway all the adjacent country; he strove to found his power on a basis of justice and peace, and died in the midst of prosperity. His son Risk-i-Pal succeeded to his father's power, but died after the first year of his reign. His son Neohaunah Pal after him ruled the kingdom, and in the province of Alanpoor he raised the village of Jerhelah: he also founded idol temples and instituted the worship of them: this prince delighted in hog hunting, and in one of his encounters with them a large boar gored him with his tusks, which caused his death. His son Amur Pal succeeded to the kingly power, and after ten years of mild sway he also departed this life. After him Beheen Pal succeeded to the throne: he built the idol temple of Beheen Asur, and after reigning prosperously for twenty-five years he also died. Kenek Pal mounted the throne of his fathers, and reigned prosperously for twenty-one years. After his death his son Raj Pal ruled in the midst of power and riches for ten years. Bhooj Pal succeeded him, and after reclining nine years on the pillow of peace and power he died: the idol temple of Cheter Bhooj Roi was built by him on this mountain, near Baheeroon Bool. After him his son Buddum Pal ruled the affairs of the state, and died after a prosperous reign of twenty-nine years: the idol temple of Luchmee Narain was founded by him. After his death his son Anauk Pal lived and ruled in the midst of plenty and happiness for twelve years. It is said Anauk Pal visited the above-mentioned dervish, (Gwalior Poi,) and learnt the science of alchemy from him: during his reign coins were struck in his name, weighing five tolas. Mehender Pal succeeded him, and reigned for thirteen years. Chint Pal followed and reigned fourteen years; he built the idol temple of Hustie, and was succeeded by Bussunt Pal, who died after a reign of seventeen years; after him Sees Pal reigned three years. Duhund Pal, his successor, died after a prosperous reign of eleven years; and gave up the throne to Luchmee Pal, who reigned four years. His son after him, Loohunder Pal, reigned ten years; in the neighbourhood of this castle lies the village of Harjiar, which was raised by him. His son Bahunder Pal was king after him: the castle of Bahunder is a fragment of his power; in its interior he built a tank, which exists to the present day. Ajee Pal succeeded him, and died after a reign of nine years. We have already reckoned twenty of Sooruj Seen's descend-

ants; we will now write down how many more reigned since that time :—

	Years.
Asaul Pal,	4
Sees Pal,	4
Bhoo Junk Pal,	19
Beheroon Pal,	3
Ketch Pal,	13
The palace of Hees Khawa was built by him.	
Chunder Sankir Pal,	9
Koomunt Pal,	18
Nakees Pal,	8
Jakeer Pal,	11
Maddah Pal,	7
Hof Pal,	1
Kant Pal,	32
Keerut Pal,	3
Danee Pal,	11
Nahab Pal,	4
Heer Pal,	36
Cheter Pal, Ser Pal,	11
Bhoom Ander Pal, Seur Pal,	9
Nak Ander Pal,	6
Sind Pal,	1
Sind Hoo Pal,	7
Mookeez Pal,	9
Rooder Pal,	6
Maadn Pal,	20
Ajee Pal,	14
Sudman Pal,	20
Burbeder Pal,	30
Kander Pal, he was very handsome,	21
Beej Pal,	21
Deerunder Pal,	15
Ramchunder Aser Pal,	30
Dhood Pal,	6
Aroo Damand Pal,	8
Rasal Pal,	15
Anauk Pal,	7
Jerauk Pal,	50
Anant Pal,	5
Kaj Pal,	7
Jackdent Pal,	3
Jackdeep Pal,	3
Kanak Pal was blind and childless; his brother succeeded to the kingdom; he presented strangers with rich and valuable presents.	
Bhoon Pal,	3
Herchund Pal,	17
Berak Pal,	3
Jelek Pal,	11
Bajee Pal,	9
Nahander Pal,	6
Telek Pal,	5
Pertaubrood Pal,	10
He was a great and rich man.	
Maddah Pal,	7
Bhao Pal,	3
Asoo Pal,	30
Ander Pal,	3
He lived in the hills and forests.	
Ker Pal,	20
Kerun Pal,	16
Agar Pal,	9
He delighted in scents; it is said he first planted the jessamine flower there.	
Jees Pal,	11
It is said that on the battle day thousands sought his protection.	
Rutun Pal,	1
Mar Pal,	19
Maddah Pal,	20
Punj Keren; the close of the Pal dynasty.	

Punj Keren, son of Maddah Pal, succeeded to the kingly power. Gwalior Poi prophesied that if any of the descendants of this tribe should change the title of Pal, the sovereignty and power would fall into the hands of another race: this change now took place as he had foretold. They say that at Anpur, which is the native country and habitation of the Keachmossa tribe, there still exists an ancient castle and city; there was a rajah, by name Runmal, of the tribe of Derun, who had only one child, a daughter; he gave this daughter in marriage to Punj Keren Gwaliory, and, as is customary with Indians, he sent him all the necessary marriage presents. After a time, Punj Keren also prepared his marriage presents, and started for Anpur with great ceremony and state, and was married to that rajah's daughter according to his own faith. It was a time of great feasting and joy, much

money also was spread amongst the people; Runmal presented the bridegroom a very valuable present of fine elephants, horses, rich jewels, gold, and all kinds of fine cloths; and as Punj Keren was a very handsome young man, the Rajah of Derun, after consulting his wife, determined to adopt him as their son, as they had none of their own, and, should he agree, to give up the kingdom and power to him. As the country of Anpur was a more open and extensive district than Gwalior, Punj Keren agreed to their plans, and finally left Gwalior to rule and reign in this country. Two years after this incident, Ram Deen, the old governor of Gwalior, wishing to have the sovereignty all in his own hands, sent a letter to Punj Keren, in which he stated the length of time he had served him as an obedient and faithful servant; he further stated that as, for many reasons, his highness could not return to this country, and it would not be advisable to give the governorship of the place to strange people, he requested that he and his descendants might keep possession of the castle. Punj Keren agreed to this petition, and sent him an answer to his satisfaction. Ram Deen ruled the place for nineteen years, and from that time the tribe of Purhor held the government of this country. Seven of that tribe reigned in the following order:—

	Years.		Years.
Rajah Ram Deen,	19	Nosunk Deen,	15
Beerun do.,	7	Noosunk do.,	17
Meker do.,	13	Parnaul do.,	21
Rutun do.,	11		

During the reign of Parnaul, the tribe of Purhor ended with his slaughter, and Sultan Shems ed Deen took possession of the castle of Gwalior during his time, as will be seen by reading the following pages of this history. Sultan Shems ed Deen was a Turk, and slave of Sultan Koolb Eldeen, who had been also himself the slave of Sultan Meg Eldeen. Koolb Eldeen loved Shems Eldeen so much that he gave his own daughter in marriage to him, and made him his successor. He gained many victories, and made many conquests in India, as far as the kingdom of Koor and Bengal; the frontiers of the Deccan and Jalghan also fell into his hands; and, flushed at his further successes in the Deccan, he determined to obtain the caliphate of Delhi, and, in seven months, reached Augeer. It is said he had at this time 96,000 horsemen at his command. The day after his arrival he commenced plundering Augeer; and observing in one of his plundering parties the high turrets of Gwalior, which the old rajahs had raised, the sultan inquired what palaces those were in the distance. He was told it was the castle of Gwalior, belonging to the tribe of the Keachmossa, who had inhabited and ruled in it for a long period, during which time they had erected these lofty palaces. They also informed him that Rajah Mal Deen of the Keachmossa tribe held at present the dominion of the country. The sultan then inquired whether the rajah had ever come to pay his respects, or whether he sent the usual presents

and tributary money. The ministers informed him that no Mohammedan king had as yet ever been able to take this castle; that its rulers had always possessed great power, and had never submitted in the slightest degree to any one. The sultan was angry at hearing this, and, after long consultations, in which he abused his ministers exceedingly, he invoked the Almighty by prayers, and swore by his power and might he would not rest until he had taken the castle and built a Mohammedan mosque in it, and instituted Mohammedan laws and customs. Accordingly he started on the first opportunity, and reaching the castle in a short time, blockaded it that very day; the besieged strove strenuously in its defence, and like brave men never for an instant left off attending to their duty or guarding the bastions: their guns, powder, and other weapons were all in a state of perfection. The sultan's intentions were to take the place by storm, and he in person went round and raised the redoubts and intrenchments with much care and trouble, and on reaching the Jah-i-Jemal the thought struck him that as the castle was below this position it would be better if he could contrive to make a passage across: upon this he commanded his men to bring a number of bags, full of every kind of material, and by throwing them in one place it would gradually fill up the hollow, and the means of crossing would then be obtained. The road at length was actually raised on a level with the castle walls, and his bravest and most courageous men fell at once upon the castle by this road. The besieged, unconscious of their proceedings, thought that the king had all this while been merely reconnoitering the castle, and was returning to his camp in despair; but they were apprised suddenly that his bravest men had mounted the castle walls on the southern side. It was the custom of the rajah, who was a hard drinker of intoxicating liquors, never to allow his people to speak to him on any affair without his especial permission. Through fear of this order no one dared state this critical position to him; but his servants and people, who were in a great state of anxiety for the rajah's wife and children's safety, had prepared for their flight, but they killed their own wives and daughters out of regard of their virtue. At last, affairs reached that extremity that they were obliged to oppose the Mussulmans with their whole strength and power; and after a glorious fight, in which they displayed bravery to an eminent degree, an immense number were slain on both sides. It is said, that for nine hours the contention raged awfully, but the victory was declared for the sultan's troops, and the brave rajah with all his people fell victims to their rapacious sword. The sultan on entering the castle returned thanks to God with his face to the earth; and during the last remaining hour of that very day he laid the foundation of a mosque, and ordered the Mohammedan prayer to be proclaimed forth in a loud voice; and the news of the Mohammedan successes was soon spread abroad. The above victory took place in the year of the Hejira 630. It is recorded in many of the histories of the sultans of India. After taking

the castle the sultan carefully surveyed the surrounding country, and ascertaining that very little water could be found near the castle—that in fact in the castle itself, besides the tanks of Sooruj Kand and Konkalla, no other water was to be got anywhere else, he ordered a fortress to be built on the passage which he had constructed, and was to be extended to the hills close by. In the interior of this long fortress he built a reservoir, to which he gave the name Ravai: its waters were very pure and delicious, particularly in the summer time. At that season it was so cold and pleasant that it was compared to snow water. It is also said that it was beneficial in curing sick people, and to this day its waters are transported for the use of rich people. It is proved beyond a doubt, that such delicious water as this has seldom been found. After the close of the invasion, when the sultan had rested a while from the toils of war, and had also finished building the above-mentioned wells, his thoughts reverted to the kingdom of Delhi. He appointed Seyed Yakoob, one of his own kindred, as governor of the castle; the rank of magistrate and overseer of the surrounding lands he gave to Bahader Khan; and himself with great state and show arrived at Delhi. He reigned prosperously, and spread abroad the blessings of a mild sovereignty: to rich and poor he distributed presents with a liberal hand, and, two months from this period, was ushered into immortality. Sultan Koob El Deen and Sultan Feroze reigned together for a long time after him. During the reign of these kings the appointment of Kootwal was not necessary in the castle. In the course of time Sultan Alan Edeen succeeded to the kingdom. Sekunder Khan, one of the sultan's old servants, had a Rajpoot servant, by name Chund No Moora, of Dunderooly in the province of Cisan. One rainy day in the rainy season Sekunder Khan was on the watch as sentry. The night was very dark and cloudy, followed by rain, which fell in torrents. Two armed Rajpoots remained awake, and on the alert all night at their posts. The other sentries were all asleep but these two. The king perceiving this, asked them who they were, and the name of their master. They replied that they were Sekunder Khan's servants, and were come to serve the king and be ready at all hours. The sultan was very much pleased at this, and told them that if they had any petition to make they had only to make it known to him. They then stated, that as their tribe were living in the forests and deserts, and without any fixed abode, they would like to be permitted to live in the district of Gwalior—that should this be granted them, they would live and die in the sultan's service. The sultan replied he would grant them their desire himself the following day; but they answered that the ministers and councillors of the state found a difficulty in seeing the king, and that such poor Rajpoots as they were would never be admitted into the court; but the king told them to stand waiting for him, and he would not forget them. The following day the sultan seeing them standing, immediately permitted them to enter, and presented them

with the district of Gwalior for their tribe to dwell in. They soon reached Gwalior with great delight; but the Seyed who was appointed in the reign of Shems Eldeen was still governor of Gwalior, and, in opposition to the commands of the king, denied them admittance even into the castle, and as the Rajpoots saw it was useless attempting to do anything, offered to become their servants; and as they were constantly in the castle showing their submission, the Seyeds at last grew quite indifferent about them. After they had passed a long time in the service of these Seyeds, they one day begged the Seyeds to permit them to give a feast at Baranepoor, and with much entreaty persuaded the Seyeds themselves to come there. The Seyeds with all their family and dependants went there, and drank freely all kinds of intoxicating liquors, besides bang, opium, &c., which is the usual custom amongst Rajpoots; they also ate with much appetite of every kind of dish that was set before them, and then ungirding themselves of their arms they went leisurely to sleep. In the meanwhile the treacherous Rajpoots had collected their whole tribe of Hoonooran, whom they had concealed near the house. A large party of this tribe, disguised as ploughmen, bringing the dinner utensils with the rice and other kitchen necessaries in baskets on their heads, had thus contrived to reach the place. After long consultations they determined, the instant dinner was over, on hearing the password of Joograat, to surround the encampment, and, cutting down the tent ropes, rush in and carry off the two Seyeds, with all their dependants. The treacherous party who were watching a fit opportunity rushed in the instant the party had broken up and had gone to sleep, and cutting down the tent ropes, slew the two Seyeds with all their people. It is said, that when the Seyeds came to the feast, they were followed by all their dependants, and the castle was left quite empty with the exception of one woman, a singer. This woman hearing the distant clamour and confusion, closed the doors of the castle, and, hanging the drum round her neck, paraded over the walls and beat it in every quarter of the castle. The Rajpoots were amazed at this, and thought there were still some people in the castle who had risen up in arms, and were deterred going near the castle for three days; but when they found out their mistake, they tempted the woman with bribes, and said they would give her five of the surrounding villages to remain for ever in her possession. The woman trusting to the good faith of the Rajpoots, gave up the castle. From that time the castle remained a long time in the possession of the tribe of Tanooran. Seven of this tribe ruled the place successively, in this order:—

	Years.		Years.
Bamaldeen, . . .	5	Peerundeen, son of Bamaldeen,	9
And his brothers,—		Dukshundeen, . . .	15
Odeernudeen, . . .	9	Tersunkdeen, . . .	25

He dug the well of Jookirvan. The water of this well was con-

sidered the best in the whole city; in fact, no water could equal it. It is very beneficial in promoting quick digestion. It has on sick and infirm people the effects of . The rajah appointed two people to take charge of this well, with the strictest command to deal it out in equal quantities to rich and poor. The gate of Kaneegbool, which is opposite the citadel, and the third gate Badilkaddah, was built by him. After this rajah, his son Keerudsing reigned for twenty-five years, and built a tank which he named Keerud Sing. On one side it extends to the Balarajah hill, another reaches Sunkerpoor, the third side reaches the hill of Auly, and lastly, the fourth side extends to Keherpoor, but that reservoir has now gone to ruins. To this day, in the middle of that desert, stands a temple, and Mussulmans on holidays visit it as pilgrimage. The whole interior of its reservoir is now full of plantations and cultivated spots. After this rajah, succeeded his son Kaliaumeel; he reigned twenty-seven years: his brother Bemadoor built the first gate of the Badilkaddah. Rajah Man succeeded his father Kaliaumeel, and ruled this country fifty years. He was very victorious, and took many countries; the Palace of Maunmender, with its twelve turrets, its underground chambers, and its corridors, is a testimony of his power. He took great pains in the building of this palace: it took the masons twenty-six days in polishing and squaring each stone. On the 27th day an observation of the stars was taken, and in an auspicious hour, which the brahmins call Pookoba, they commenced using the stones in building the palace; in a short time, in this manner, this palace was built on a firm and permanent basis. Rajah Man was very fond of amusements, and passed his days in festivity and joy; he gave encouragement to wise and ingenious men; merchants and brahmins he securely protected; he delighted to dwell and talk in great assemblies. The rajah had a queen whom he preferred to all his other wives; he used to sit long and associate much with her; she built a tank opposite the castle of Jenoob Rojia, which is named Ranni Sankir. On its banks she built a splendid palace, surrounded with pleasant verandahs and corridors; it exists to the present day. This queen had a maid who also built a reservoir, which she named after herself; but as its waters escaped from it, she opened a passage from the Ranni Sankir reservoir, and by its waters kept up a supply in her own. After the death of Rajah Man, his son Bekermajeet, who was the last of this tribe, succeeded to the kingdom; he reigned three years: but during his time the castle fell again into the hands of the Mussulmans, and the governorship of the rajahs terminated in the manner we will now record. When Sultan Bhoolooloodi overcame India, Rajah Man was governor of Gwalior; the sultan, returning from the conquest of Joonpoor and Kaulee, went to Dhoolpoor by way of Chundwor; the Rajah of Dhoolpoor presented him with a few maunds of gold, and advised Rajah Man to hasten and present himself to the king, otherwise one of his servants would assuredly obtain the governorship of the castle. The rajah presented the sultan with seventy lakhs of teneka, a gold coin,

and he was left unmolested; but when Secunder, son of Bhooloo-loodi, succeeded to the throne, he also despatched armies to Joonpoor and Kaulee, and sent some of the princes as governors there; he himself determined upon going to Gwalior,—and as Rajah Man had not the means of resistance, he sent him greater presents than what he gave his father, and submitted to obey the sultan as his slave, and strike the coins in his name. After Secunder's death his son Ibraheem ascended the throne of his fathers, and ordered that a person should be sent to Bekermajeet to command him as a loyal subject to come and show his obedience—if not, he should be killed; but to no purpose. Azeem Hoomayioon was then sent to blockade the the castle on all sides; in a few days, he ordered the Badilkaddah gate, which was on a level with the ground, to be burnt down; his victorious soldiers entered by this road; the Rajpoots opposed them with great bravery, and a great many were slain. In this way three successive gates were taken. When they reached the bridge of the fourth gate, one of the king's old servants was slain there: the king ordered that he should be buried on that very spot, and from that place they took up their position at the foot of the citadel. The following day, through the mediation of some ministers, Bekermajeet gave himself up with great humility. Azeem Hoomayioon sent him to the king, who rewarded him with valuable presents of elephants and horses, and settled on him a fixed salary, with the province of Shemsabad; the governorship of the castle he gave to Azeem Hoomayioon,—but as Ibraheem placed no confidence in his father's ministers, he killed every soul of them whom he thought could stand in his way, consequently, as Azeem Hoomayioon's tribe was very large and powerful, he feared so see him remain in so strong and well fortified a position—but as he bore a very high character, he could not kill him openly, but sending for him he murdered him privately. Selim, terrified at the news of his father's death, evacuated the castle and marched into the eastern provinces; but Berijia Khan, the governor of Bahar, had raised some troops and killed him also, according to the order of the sultan. The Soodrans, distressed at hearing of these disturbances, separated from Ibraheem; they first went to the Punjaub, and there entered the service of Zeheer El Deen Mohammed, the Emperor Baboor at Caubul. To him they stated the troubled state of the Indian government, and their own fears and apprehensions of Ibraheem's tyranny. The emperor, having gained the conciliation of these men, set out to conquer India. He fought a dreadful battle at Paniput, in which Ibraheem was slain. The account of the battle is well related by the Indian historians. Bekermajeet, who was Ibraheem's devoted follower, behaved very bravely, and fully repaid all his master's kindness to him. After the battle, Hajee Reheem Dad, one of Baboor's followers, was appointed governor of the castle, and remained some time there; but Baboor, from some unknown cause, distrusted both Hajee Reheem Dad and his uncle Hajee Mahodi, who was governor of Lahore, and determined to kill them. Hajee Reheem

Dad, on being informed of his intentions, at first determined to seek the protection of some Hindoo rajah; with this view he intrusted the government of the castle to the care of Dersinker, who was a Rajpoot and a landholder in that province, but Sheik Mohammed, one of the greatest men of the times, and who had great power with the different kings, was on his way from Hajeepoor, his native country. He was living in one of the temples on the road, when he was apprised of Hajee Reheem Dad's intentions of flight, and dissuaded him from it. He sought an interview with the king, and spoke much on his behalf, saying that it was not right or advisable to leave the castle in the government of infidels. The emperor, being a kind-hearted man, through the intercession of the sheik, overlooked his objections to the khan, and placed him in his former situation; but in a short time he again changed his mind, and gave the governorship to Futeh Khan. In the course of time, the emperor died after a prosperous reign, and his son Zeheer Eldeen Mohammed Hoomayioon succeeded him. This king went in great state to Gwalior, and spent a long time there. He built the beautiful palace of Hoomayioon Munder, which was a loftier and more splendid palace than any other of the palaces there. After a time he returned to the capital, from whence he went to Bengal, where he spent a season of amusement and festivities. His return was opposed by Shere Khan Soor, and he suffered a very heavy defeat, which compelled him, with his nobles, to fly from place to place through Candahar and Khorassan, until he found an asylum in Persia. The empire of Hindostan then fell into the hands of Shere Khan, who took the title of Shah. We will now relate the incidents that took place during hisreign. He first visited Gwalior, and repaired the palace of Munder; he built a splendid tank in its interior, he made many improvements, and planned many judicious arrangements; but, unfortunately, whilst invading the castle of Kalanj, a howitzer burst through negligence, which, hitting him, caused instant death. His son Jelaul Khan succeeded. He also lived in Gwalior for a long time, and after performing many noble actions he also died. His son Moobariz Khan, on his succession to the throne, slew the son of Feeroz Khan, his nephew, who was yet at the time a tender infant. He assumed the title of Adil Mohammed Shah, and was much respected by the people for his justice: his subjects all knew him by this name. He was of an indolent and happy turn of mind, and associated much with singers and jesters, and was delighted with the conversation of women; but during his reign many insurrections were raised, and disturbances set afloat. His uncle's sons Iscunder and Ibraheem rose up in arms and marched upon him, taking to themselves the title of kings; but Meemoon, (formerly a grocer,) who had attained the lofty station of a minister of Adley's, was generally successful in appeasing and quieting the factious parties: in Adley's reign, his slave Baydil was the governor of the castle. Adley, after a reign of four years, was killed in battle. The empire descended to Jelaul Eldeen Mohammed Akbar Padshah, who

spread throughout the world the good tidings of justice and peace. The castle was still governed by the slave Baydil. About this time, Ramsad, a Rajpoot, having collected a very large and numerous force about him, had marched upon the castle, and was blockading it: in the meanwhile Giah Khan, one of the ministers of state, was appointed to march to its relief—he was considered a very clever man: when within two miles of the castle, Ramsad abandoned the blockade, and advanced with the determination of fighting. The battle was very severe, many of the bravest fell on both sides: neither side stopped to draw breath for a single moment—they fought thus for three days, at the termination of which victory was declared for the Mussulman army. Giah Khan, after routing the enemy, arrived at the castle the next day, and taking up Ramsad's position, severely blockaded the place; his men were well protected behind the redoubts and intrenchments; the besieged at last, receiving no assistance from any quarter, were obliged to surrender, and with great reluctance gave it up into the hands of their besiegers. Akbar Shah's people were masters of the place for fifty years. The different governors succeeded each other in this order:—

Rajah Ackeran, three years, Kechwasa.
Alli Koolee Khan, nine years.
Seyed Cassim, seven years.
Rajah Baug Singh, son of Ackeran, three years.

When Mohammed Jehan Geer succeeded to the empire, he reigned (like a second Alexander) for twenty-two years. Several people were governors during his time, in the following order:—

Sheik Moobdah, brother of Mooazim Khan; Aitiber Khan; Shojah Khan, better known as Kebeer Khan; Moohabut Khan; Asuf Khán, son of Antimand-i-dowlah; Rajah Peer Narain; Jater Khan Suffrachee. When Moohabut Khan was governor of the castle, he took a plan of it with its buildings, and sent it to the king, who was displeased at observing that the palace of Shere Shah was loftier and more firmly built than the palace of Hoomayioon Munder, ordered it should be pulled down and razed on a level with the ground, and that its materials were to be used in building the palace of Jehan Geer Munder, a beautiful and splendid building: this palace was given into the charge of the Rajah Peer Narain, who was governor of the castle for many years; this rajah was of a very kind and good disposition, and very charitable to poor people—he was liberal to people of every tribe and nation, and behaved generously with everybody—with all these virtues, he was of a very kind and humble disposition. Jater Khan Suffrachee succeeded him in the governorship—he also was a very good-natured religious man, and passed most of his time in prayer and religious observances, and loved to associate with pious and clever men. When Jehan Geer departed this transient world for eternity, the empire descended to his glorious and noble successor Shah-i-Jehan: in the first year of his auspicious reign, Seyed Moozufer Khan, of the

province of Baura, who was held in greater respect and estimation than any other of the king's people, who was applauded for his munificence and generosity everywhere, obtained the title of Khan-i-Jehan and the governorship of the castle. He governed nineteen years, and went twice to see the king, by whose permission he placed his son Seyed Mansoor with a few careful people to guide him in the governorship of the castle. Seyed Khan-i-Jehan was one of Sahib Keran the Second's greatest ministers; he was a fine noble-minded person, generosity and high-mindedness were stamped on his open countenance—he loved clever and ingenious men, and appreciated the talents of the pleasant and witty; besides possessing the standard virtues of candour and liberality, he was of a brave and courageous nature; it is said he had an elephant named Koonwur Kelee, of a very strong make, and as courageous as it was powerful—in battle it rushed on the foe and trod them down in multitudes, the enemy on both sides were forced to give way, by this means he always opened a passage for himself. At length the Khan was compelled to march against Khan-i-Jehan-i-Sodi, with whom a tremendous battle ensued: much bravery was displayed on both sides. An animated account of this battle is given in the Indian histories. Khan-i-Jehan-i-Sodi was killed in this fight; it was for this splendid achievement that Moozufer Khan obtained the title of Khan-i-Jehan. In this battle the elephant proved of great use, and as the Seyed had a great affection for him, he ordered a stone resemblance of it to be made, and when finished, placed the statue opposite the northern gate of the deceased Khan-i-dooran, near the mendevi or park, which Moozuferpoor had planted and named after himself, which is situated close to the northern mendevi or park—he planted a pleasant garden, in the midst of which he erected arbours, &c., it was a general resort for all classes of people who wished to enjoy themselves. Only a few trees are now left to mark the spot. Near the house of Seyed Kasoo he built a beautiful palace for himself; its rooms and terraces are lofty and numerous. In its spacious courtyard he built a splendid reservoir; round it he planted large meadows; no place in the whole city could bear a comparison with this for beauty or comfort. It is said that the Seyed used to take plans of all the buildings of Hoomayioon Munder, Jehan Geer Munder, &c., and send them to the king. As the materials of Shere Khan's palace had been consumed in building the palace of Jehan Geer Munder, and an empty space was left, he ordered that on this empty ground the palace of Shah Jehan-i-Munder should be built close to the Jehan Geer palace. During the Seyed's governorship, the building of the palace was finished; its rooms are lofty and numerous, and its courtyard beautifully laid out: opposite its large audience-chamber a large tank was dug, and around it beautiful gardens were planted: the khan's reservoir was joined to this tank. This palace is situated on the eastern side, and is considerably elevated above the rest; it was a heart-enlivening and delightful spot; all those who were sick generally visited this castle, and lived in this sweet

retreat. Outside this palace, on its western side, is a house for the poor, and inside the walls is a bungalow, and near it a lofty gateway. When Seyed Mansoor was governor, he planted a garden, which he named after himself, on the banks of the Soonreekh, which to this day is a pleasant resort for all classes—it is surrounded with strong walls, and is a delightful place to dwell in. He also built the mendevi of Mansoorpoor, which exists to the present day. Khan-i-Jehan, after a governorship of nineteen years, went to Lahore, and died there; and Seyed Saulaur Khan, one of the aforesaid Seyed's oldest servants, presented himself to the king, and entreated that, as he was a true Seyed, the governorship of the castle might be given to him: he gained his desire, and was appointed governor and overseer of the surrounding districts. After a period of two years he left his brother Seyed Alum in charge of the castle, and proceeded himself to settle some affairs in the provinces. Seyed Alum was governor for five years; he planted a garden near Meher Ali's house, and built the mendevi of Shah Ganjaband, near a place called Gesapoor, and as the planks of the Badilkaddah and Pelpoor gates were old and rotten, Seyed Alum put in new planks and clamped them together with iron clamps, and fixed in long iron spikes to prevent elephants ramming them down in war time; but when the bad actions of Seyed Alum came to light, the nature of which for his sake we will not relate, his majesty was annoyed with him and transferred the governorship to Maharbut Khan's son, Kerschid Khan, who ruled two years. After this he returned and governed the castle; he was a liberal man and generous to all the distressed and widows—he paid great attention to all the travellers and residents of the place, and built an audience-room close to the northern tower of the Badilkaddah outside this palace, and sat there on appointed days to receive the visits of those who came to see him. Formerly the drums were beaten for the sultan at the Seenapool gate; but as the sound could not be heard from this gate, he ordered a house for the drummers to be built near the city. Ever since, the drums are beaten there, close to where the walls of the castle stand loftiest. He built a treasury and finished it, with the exception of enamelling the interior walls. He also dug four wells in this building. After six years he was intrusted with the management of the affairs of the Deccan. After placing a proper person in charge of the castle, he himself repaired to the Deccan with a numerous army. On his return, he gave the worthy khan the Soobadari of Caubool. His successor in the governorship of the castle, Akheeraj, an old servant, was very attentive to his duty, &c. This brings us to the thirty-second year of Sahib Keran the Second's reign, to the year of the Hejira 1065. We must now recount the histories of other kings, for, by God's will, who raises one king whilst He is destroying another, Sahib Keran the Second was attacked by some severe disorder, from which it is said he could not cure himself. The reports were so exaggerated that all believed him dead, and that he had given over the reins of government to his son Dara Shoo-

kooh, whom he had entitled Wala Shah Blund Acbaul, and had made his lawful successor and heir to the throne; but Dara Shookooh was so led away by the conversation of a strange sect, that he at last disbelieved in the Mohammedan faith, and took up a religion of his own. He also imprisoned his venerable father, and cast an avaricious eye upon the Sultanut of Indostan. To obtain his ends, he first shut up all the roads by which news or intelligence from the interior could be obtained, and sent armies against all the other princes, who were all governors of different countries, commanded by his son Soliman Shookooh, Rajah Jeensing, Dileer Khan, and many other brave khans and people: the army amounted to 45,000 men. Sultan Shujah, terrified at these disturbances, retreated instantly to Delhi. Rajah Jesswunt Sing was also despatched with another army, and the following officers—Rotee Khan, Kossim Khan, Raiskana Jesordea Aftikarh Khan, Makan Sing, Hodan, Joosshan Sing, Dihi Sing, Baldans Jelanla, and other khans besides, who were all commanders of troops, &c., to attack Moorad Buksh, who had collected 50,000 men in Guzerat, and who, taking advantage of the confused state of affairs, indulged in the ambition of taking possession of the throne. In the meanwhile, Sultan Sujah had encountered Suliman Shookooh in a terrible battle on the plains of Bahadoorpoor: the battle was severe. After much bloodshed and fierce contention, Sultan Shookooh fled to the western provinces, and left Suliman Shookooh a conqueror on the field. Prince Moorad Buksh seeing that he could not contend with the numerous army of Rajah Jesswunt Sing, and not being able to retreat or advance, implored the protection of Alumgeer's people, and despatched a letter to his majesty, in which he stated, that as the government of India had been so many generations under the Mohammedans, and ruled according to the institutes and laws of their faith, it would be very disgraceful to allow those who were infidels, and governed contrary to its principles, to take possession of it; and that he hoped his majesty would strive, with his whole strength and power, to redeem its falling character, and ward off all violation to its principles. Just then Alumgeer's generals and army were subduing the strong forts in the Deccan; Beder or Hoosuabad, which is one of the strongest forts in India, fell into their hands. After taking it, it was named Zeferabad. The castle of Kaliaunce was also taken, which is the strongest castle in India, and likewise a general asylum for all the people of the Deccan in times of danger. When King Alumgeer heard that Dara Shookooh, under a false pretence that he was mad, had imprisoned his venerable father, and like a wicked infidel had thus heaped misery upon him instead of comfort and support—that he had also been the cause of all those contentions and disturbances by sending forth armies to depose all the other princes,—Alumgeer, who was of a religious turn, took all this to heart, and determined to march upon Delhi, and left the affairs of the Deccan to Mohammed Sultan; and Moozem Khan, with other great ministers besides himself, marched to Aurungabad with great state. At this city he

heard that Moozem Khan spoke secretly, and held private conversations with the illustrious prince Mohammed Sultan. He therefore sent for Mohammed Sultan, and despatched Mohammed Moozem to take up and resume his appointment, with orders to join Moozem Khan in reducing completely the kingdom of the Deccan; but on account of the awful contentions and dissensions that shook India at this period, his intentions did not succeed, for the treacherous Moozem Khan, listening to the negotiations of Dara Shookooh, had in secret promised to come over to him. As he was after this regarded with much suspicion, he wished by some private means to reach Dara Shookooh, but the will of the Almighty was otherwise, and, from other reasons, he was compelled to accompany Mohammed Moozem to Aurungabad. Here, also, he behaved as treacherously as he was able, and as much as ever remained aloof in serving to advance the interests of the king. At last fate decreed that he and another villain, Rustom Meerza, should be caught and sent prisoners to the king, whose ministers fearing to trust again such dangerous people with liberty, sent them captives to the castle of Douletabad. His majesty's mind was thus relieved from further trouble from that quarter, and he was preparing to start again with a powerful army to release his father, when, on his arrival at Booranepoor, he was informed that Shah Nawauz Khan was brooding mischief, and that, with an outward bearing of obedience and submission, he was inwardly perfidious and treacherous. After imprisoning him also in the castle of Booranepoor, his majesty continued his journey, and advanced stage by stage on his way. Wonderful God! who performs such plans, and brings about such changes in the fortunes of man, that it is necessary to possess an eye like His to see through His wise designs: in short, when Alumgeer reached Dhoolpoor, the Prince Moorad Buksh, who knew well he could not oppose the large army of Jesswunt, implored Alumgeer to take him as an auxiliary force, and also implored his protection. The afore-mentioned rajah had with his whole force, which consisted of Rajpoot spearmen, infantry, &c., reached Ojein, which is seven koss from the sea of Keper. Here the two opposite armies met rank to rank, (on which memorable day took place that fight when the hills were divided, and the rocks rent in two, and men stretched forth their valorous arms like ferocious lions;) the troops of Alumgeer and Moorad Buksh darted on the foe with their high-spirited chargers, and thousands of the infidel Rajpoots, caring nothing for sacrificing their lives, were trampled down by their victorious chargers. But the rajah, trusting to his great strength and unlimited resources, strove with his utmost power to maintain the upperhand—never flagging for an instant, and like true Rajpoots, showed impetuous bravery and utter recklessness of life. But who can oppose the will of God? After much bloodshed, and although the rajah had exerted his whole soul in this awful display of bravery, with a high spirit of emulation, victory favoured the troops of Alumgeer. His objects were all fulfilled; the news of the victory was quickly noised everywhere; and the victorious army, from their successes,

gained fresh courage; but the defeated, through their impiety and wilfulness, heart-broken and cast down, betook themselves to flight in the desert, and thousands lost themselves in its whirlwinds of sand. Much valuable property and expensive treasures, such as cloths, tents, horses, elephants, and carriages laden with goods, were lost; the dead bodies heaped on the plain were counted after the fight, and amounted to 5000 Rajpoots who fell by the sword; there were many others besides—their numbers could not be counted; the beasts of burden that were killed or died were innumerable. After the battle, Alumgeer prostrated himself on the earth and prayed to God, and encamped on the battle-field. Thanks be to God, that victory was a forerunner of the conquest of India: on that very day Alumgeer was proclaimed king. His army had got so emboldened from this victory that they determined to advance without any further fear, and they passed each successive stage rapidly, day by day; and from the effects of their victory, by the will of the Almighty, were joined by all the landholders and governors of districts as they advanced. His majesty's superiority and power was every day increasing from these rapid successes, (for he who obtains a kingdom by the will of God, accursed is the man who attempts to oppose him.) Prince Dara Shookooh trembled when he was told the news of this victory; he grew so confused and distracted that he rendered himself despicable in the eyes of his people. He still, however, determined not to give in, and indifferent to shedding the blood of thousands, he again made the necessary preparations for another war; with this view, he conciliated Hubbeeb Oolah Khan, Rustum Khan, Rajah Suosaul, Hadijee, Ram Sunker, and others, to his side, who were all powerful landholders and possessors of troops. By these means he swelled his army to one lakh of men; and full of pride at his being the lawful heir, and a desire to redeem his character by obtaining the sovereignty, he left Akberabad, his capital, with all his ammunition and guns, and advanced upon Dhoolpoor, where he blocked up all the roads by which he thought it most likely the king's army would pass; he also choked up the wells, and thought that, with God's assistance, he was now secure. Deceiving himself with these false ideas, he was anxiously looking forward to the time when he should be crowned with victory. In the mean time, tidings of these circumstances reached secretly the ears of Alumgeer's ministers; but God Almighty had cast His favour and protection upon their troops, and they without fear advanced by the road of Behdaver. When they arrived within a short distance of Gwalior, Akheeraj, who was still governor in place of Moohabut Khan, hearing of their intentions, shut up the gates of the castle, and prepared for a siege. Alumgeer, with a determination to take this castle, with the mountain of Rajooker, marched on to Behdaver; and Dara Shookooh, all ready to oppose his majesty's army, advanced with his numerous army by the castle of Akberabad to the Somokar country, which is on the road to Behdaver,—and the two opposite armies remained one day at a distance of two koss from each other without commencing

hostilities. Although Dara Shookooh had secured all the wells of that part of the country to himself, yet from some inward misgiving and unwillingness to fight, he did not take advantage of this favourable opportunity, and towards the close of day a shower of rain fell, from which their guns were rendered of no use, their bowstrings were also slackened; (although the unfortunate may gird up their loins, they never will get strength, but always remain weak.) The next day the sun arose in its full power, and the seeds of contention grew apace. Alumgeer commenced the battle by advancing his bravest troops; when they appeared in sight, Dara Shookooh, aroused from his lethargy, mounted with his officers and people, and marched forth, (like two hills falling upon each other, like two boiling seas, the sky and earth were invisible from the clouds of dust.) The guns of both armies poured forth their fiery streams, shedding much blood, (one might say that Sarafeet had blown his horn announcing the day of judgment.) In this furious onset and confusion, Dara Shookooh, struck with the greatness and power of Alumgeer, trembled and stood amazed in confusion at the temerity and daring courage of many of his majesty's nobles; from some foolish advice of his people, he descended from his elephant, which was instantly looked upon as an ominous sign that he had, in reality, from that moment descended from his throne and fortune. His distracted troops perceiving Dara Shookooh was not on his elephant, fled in confusion, delighted that they still had a chance of flight. Thus *that* invincible army, just on the point of victory, were dispersed in an instant, and thrown into utter confusion. Six thousand men lay dead on the field, besides a vast quantity of beasts of burden; the plunder in whole stables of fine horses, elephants, strings of camels, clothes, &c., and full magazines of every kind of article, was immense —it exceeded the bounds of description. Dara Shookooh, his sons and his particular nobles, with the greater part of his army, reached Akberabad towards the close of evening; he did not remain there a moment, but with great precipitation fled on to Delhi. Alumgeer obtained a splendid victory, which was greatly magnified by Dara's precipitation. The keys of India, like the solving of a mystery, fell into the hands of this virtuous and pious monarch. (Glory be to God! the disposer of all events—when the Almighty commands, His orders are quickly executed.) When the sounds of war and contention were hushed down, and tranquillity again restored, Alumgeer pitched his tents on the battle-field, and re-assured the timid Rajpoot who had shut the gates of the castle of Akberabad—uncertain which of the Princes had gained the victory —of peace and quietness. In a short time the army of Alumgeer began to move, and encamped in the beautiful valley of Dahra, which is the sweetest spot about those parts; from this place he despatched his son Sultan Mohammed to his venerable father to gain his good wishes and praise, and to say he was the slave of his commands; but his poor father had grown so weak and ill through sickness and grief, that he helplessly gave the prince his leave and permission to take the govern-

ment into his own hands, and also made him his lawful heir to the throne; for what is more desirable to a father than a dutiful and obédient son? His majesty Alumgeer, having first gained the sanction of his father, betook himself to the duties and affairs of the state, and despatched new governors and residents all to their respective districts; again news was brought that Dara Shookooh, after the battle of Somager, had collected all his troops at Delhi, and was determined to make another stand there. Prince Sultan Mohammed, with another minister, was appointed governor of Akberabad. Mootamed Khan and Zoolficar Khan, the present governors of Gwalior, were also sent to guide him in his affairs of state. Alumgeer marched into Delhi. When only two stages from Akberabad, news arrived that Moorad Buksh, who, after the victory, had remained separate in the pleasant valley of Dahra, had again filled his brain with some foolish ideas of obtaining the Sultanut of India,—disturbances and opposition were again set on foot, the opposed factions were again aroused, and God's creatures fell in millions. Although he was invited with kindness and entreaty to join his brother, he would not agree to come; but being advised that as Alumgeer's army was near Bunderain, he would most likely gain some successes and advance his prospects, he instantly quitted the valley of Dahra. But who can oppose that man who is favoured by God, or who can hurt with his malicious looks God's elect? Nothing in this changeable world can affect those assisted by God,—the engine of stratagem plies in vain on the castle protected by God, for He who seeth and knoweth all the plans of mankind, can turn and change them according to His own will—as in this instance. The people of Alumgeer had by some means imprisoned Moorad Buksh, with his son Ejeed Buksh, in the castle of Baraim, under the charge of Sheik Meer, and other faithful ministers, from whence they were sent to Delhi, and imprisoned in the castle of Jehanabad until Alumgeer's arrival. In the meanwhile two dangerous reports were brought, that Prince Sultan Shujah, who had fled from Suliman Shookooh to the eastern countries, had again collected his forces, and with great assiduity and activity showed an intention of falling upon Akberabad; that Dara Shookooh also had arrived at Lahore, and was there preparing for another struggle. Alumgeer, favoured by Providence, commanded Prince Sultan Mohammed to leave Akberabad and oppose Sultan Shujah. Alumgeer, with another army, marched on to Lahore; but on the road he heard that Dura Shookooh had again despaired in his thoughts of making a stand, and had marched on with haste to Mooltan, and from thence, seeing that Alumgeer was in full chase, reached Guzerat by way of Tatta and Beker. When Alumgeer reached Mooltan, he sent Sheik Meerza with a large army after Dara Shookooh, and returned to the interior of India: here he heard that the army of Prince Mohammed, who had fallen in with the forces of Sultan Shujah, joined him and was preparing for battle. Alumgeer, although in all his actions he placed his utmost trust upon the will of the Almighty, and although of such a

very powerful mind that he seldom discomposed himself even at times of the greatest moment,—yet, notwithstanding his great coolness and intrepidity at all times, for the sake of greater caution and certainty, which considerations guide all great minds, he, with the utmost haste, returned to Delhi from Mooltan, and despatched troops to the assistance of Prince Mohammed Sultan. The account of the battle is thus related: Alumgeer reached Jehanpoor a day before the one fixed for battle; the instant he had pitched his camp he issued the necessary orders for preparing for battle, and stationed his parks of artillery two *koss* from the opposite army; at the same time his able generals were placing the troops at the right and left in favourable positions in order of battle; his brave men, the whole night thirsting for victory, stood at their guns, pouring their fire upon the foe. On their side the enemy discharged innumerable arrows without intermission. The battle was fought with high emulation on both sides, the guns rolled like thunder, and the rocket spread its destructive fires like lightning; the drums on every sound reminded one of the last day; men were drowned in the blood that inundated that battle-plain. I, the author, was present at that awful fight, when the heartrending sighs of the afflicted reached the heavens, when friends knew not friends, and enemies could not distinguish each other,—the heart of man at that moment was truly like the dust of the ground,—the decapitated heads lay as thick as dust on the desert; in the midst of the fight some short-sighted foolish people spread a report that the enemy were gaining the victory, and were carrying all before them,—through this report a part of the troops who were standing some little distance off, who did not place their faith and trust in God, and who acted without meditation, imprudently took to flight. Rajah Jesswunt Singh, who was following the victorious army, took this favourable opportunity of seizing with an unloyal hand all the plunder and property of the flying, and then finding he could not any longer sustain his position, he returned to Akberabad, with the intention of placing Moorad Buksh, the illustrious prince, upon the throne; but Mootamed Khan was so extremely cautious, and watched the prince so narrowly, that he would not even allow the birds to fly across the castle. The rajah despairing returned disappointed to his native country. A short time after this, contentions subsided, and the real state of affairs was made clear and manifest, that Prince Sultan Shujah, no longer able to withstand the mighty sword of the victorious Alumgeer, fled in confusion to the eastern provinces; victory and glory again favoured the troops of Alumgeer, who sent Prince Sultan Mohammed, with a number of ministers, such as Moozem Khan, &c., to follow Prince Shujah, and take possession of the eastern countries. Alumgeer, on his return, delighted with his successes, heard the news that Dara Shookooh had arrived at Katehon from Mooltan, to assist Jesswunt Singh, who finding nothing could be done in favour of the illustrious prince, had fled confused in the direction of Akberabad, and commenced re-collecting his scattered

troops, and raising fresh ones for another encounter,—he had already liberated from the prison at Baranepoor Shah Nawauz Khan, and appointed him governor of Guzerat: he had also agreed to take side with Dara Shookooh, and was fully prepared for war. In the meanwhile, Alumgeer, with great state and show, marched upon Akberabad, and sent Abdoolla Khan to take charge of the castle of Gwalior. Akeraj and other of Mohabut Khan's people, who were then in Gwalior, placing implicit trust in the sovereignty of Alumgeer, delivered over its keys to that khan with true loyalty. Alumgeer, at the same time, sent Ameer Khan with a letter to the governor of Shah Jehanabad, in which that governor was ordered to release Moorad Buksh from the prison of Selunkaddah, and deliver him safely into the charge of Abdoolla Khan. Ameer Khan himself took Moorad Buksh, and having delivered him safely into the hands of Abdoolla Khan, he returned to join Alumgeer, who, to prevent Dara Shookooh from spreading mischief and injury, had marched to Ajmeer, where the two armies met, and an awful battle took place. Nawauz Khan was killed in the commencement of the battle, and Sheik Meer, one of Alumgeer's oldest servants, also died in that fight. Affairs terminated in the flight of Dara Shookooh by the road of Tatta and Beker to Guzerat, on the Persian frontiers. After the victory, Alumgeer returned to Shah Jehanabad, where he judiciously delighted both rich and poor with his banquets and festivals, and by his judgments gained such a high opinion in his favour from all sides, that he was raised to the throne without further doubt or opposition from any one, on the 24th of the month Ramazan, year 1068. He built a splendid palace in Jehanabad, and at length ruled the Indian empire as a final and positive possessor of the throne. No nation could have obtained an emperor more concordant with their nature: the sun of his wisdom enlightened the black minds of the guilty; and the rebellious, from his example of piety and justice, implored forgiveness. Alumgeer, thus finally, with undoubted consent, ascended the throne in Shah Jehanabad. Melek Jeerun, the landholder of Kelkeran, and Behader Khan of Kooker, with Rajah Jeesunka, who, from Ajmeer, had been sent in chase of Dara Shookooh, had caught him and his sons Sepeh and Shookooh: they were sent handcuffed to Delhi. Dara Shookooh was killed the instant he arrived at that place; they say he was killed that he might escape the vengeance of God, on account of his impiety and unbelief hereafter. Seif Khan with a few followers, were ordered to conduct Seper Shookooh to Gwalior, and deliver him into the charge of Abdoolla Khan, and then to return. Let it not pass unnoticed that Abdoolla Khan was governor of the castle for two years, and had three princes under his charge, on whose account he took such great care in watching the castle, that not a single soul without his especial leave could enter; a passing stranger dared not even look that way. In the commencement of the khan's governorship, on account of the unsettled state of affairs, provisions of all kinds being scarce and dear, the poor suffered great troubles. Abdoolla

propitiated the Almighty with prayers and petitions for peace and tranquillity, and converted the palace of Chikree and the Khan-i-Darran into a resting-place for weary travellers and poor people, and appointed his man, Mohammed Shereef, overseer of the lands and collector of the taxes. After a lapse of two years, Prince Mohammed Sultan, who had been sent by Alumgeer to pursue Prince Shujah, from some unknown reasons espoused his cause, and advised him, through his assistance, to prepare for war; but finding in a short time that he was not able to fight, he fled into the desert, and was never heard of again. Mohammed Sultan was soon caught by Alumgeer's people, and brought before his august presence. After Shujah's flight, Suliman Shookooh sought the protection of the queen Nukee; but as this queen knew that Alumgeer was firmly established on the throne, she delivered him up a prisoner, and he was brought into the august presence of the king in Shah Jehanabad. After the seizure of these two princes, his majesty ordered Mootamed and Motazeem Khan to imprison them in Gwalior, and according to the command of the king, Abdoolla Khan resigned the charge of the castle to Mootamed Khan, and went to Reenhoor. Shortly after this, the sons of Alee Nuki, the late governor of Guzerat, who had been killed by Moorad Buksh in a most cruel and unjust manner, laid their complaint before the king, who commanded that when they reached Gwalior Moorad Buksh should be delivered to them: accordingly they went to Gwalior and put him to death. His tomb is near the garden of Jungper, close to Gwalior. Suliman Shookooh, by the will of the Almighty, caught a severe illness whilst in prison, which caused his death. His tomb is also close to the tomb of Moorad Buksh.

An Account of the Governor Mootamed Khan.

This khan was governor for seven years, and from the day he entered the castle he paid great attention to its affairs and to making it a place of importance, and from his tact and prudence, he settled the affairs of the people according to their satisfaction. From the late wars that had taken place in the first year of his governorship, corn and provisions were very dear and scarce; a pearl was often given in exchange for one handful of barley; straw was scarce, and grass was impossible to be got; the poor animals suffered very much: it was with the greatest difficulty people even could find the means of keeping themselves alive. The khan perceiving this, distributed provisions in equal proportions to all the population, and, like a generous spirited man, strove to comfort and strengthen them in every possible way by his liberality, which is an inestimable virtue; he also commenced to repair the ruined palaces, and by this means many poor people were employed and kept from misery and starvation. God, to reward his good deeds, sent the following year a refreshing rain, which

irrigating the parched plains, caused them to resume their former verdure; the khan was rewarded with such an abundance of wheat that men had no longer even a longing for it. As the khan had established during the famine the custom of distributing provisions to the people in daily allowances, he still continued this custom, which prevails to the present day; he also gave every year enormous sums of money, both of his own and out of the revenues, to the poor people for the sake of charity; the high and low classes both profited by his liberality. He also settled a fixed salary upon the sect of dervishes, who, according to their superstitious faith, were not allowed to beg or mention their griefs to any one. He paid great respect to all the learned, and men of respectability, and stretched a bounteous hand upon all the destitute; all sects were tolerated by him. To his servants and soldiers he was mild and liberal, he frowned on none: his subjects he looked upon as his children, and his friends were treated like brothers. His institutions were all founded on a basis of justice and truth; all grievances were instantly redressed, the poets say: "The inhabitants of Gwailor were soothed by him; they speak wisely who say goodness is descended from him." He built a large divan near the Shah Jehan-i-Munder; its turrets are lofty and slender, and its audience-chamber large and spacious. Near Shah Jehan-i-Munder he built a bath, in which it was very beneficial and refreshing to bathe. Opposite the Badilkaddah gate, from ancient days an old wall had been built, which not only spoilt its appearance but blocked up its entrance; it was so old and rotten that those who passed by it always ran by in the greatest haste for fear of its falling; on this account the ministers of many of the former kings had often attempted but always failed in pulling down the old wall, but the khan succeeded in pulling it down; and as a great space was thus left open, he built another wall, which joined the Badilkaddah on both sides; through this wall he built another gate, the sixth in that palace, which he named Alumgeer. He also built two turrets over its gates and spread a broad arch for shade; he also built on the left-hand side of the Badilkaddah a large open chamber, which he intended for an audience-chamber, in which the trial of prisoners could be held. The improvements which he made before the Badilkaddah gate were so well arranged that the place looked more open and wider from them; the motto of the date written over the Alumgeer gate is this:—"In the reign of the good Alumgeer, whom fortune rewarded in all his desires, Mootamed Khan, through his permission, built this exalted gate over the castle; Hatif for the date of its building gave this motto—'May this place always flourish!'" Mootamed Khan built and repaired anew the eastern assembly-room, which Omtah El Moolk and Mohabut Khan had left half finished, and named it Zenzabad; he also repaired its squares, in which the population assembled on market-days, and carried on all their traffic there. Opposite this market-place he built a lofty wall, which protected it and its inhabitants; he also built a

place near this wall for all the poor and pious to sit and pray in, which he named Noor-i-Zenzabad, and built new gates instead of the old gates of the palace of Kechrea, which had grown old and rotten; and as in this quarter the people suffered very much from the want of water, they presented a petition to Alumgeer, who ordered three large wells to be dug to supply them with water. Round about them pleasant sittings and platforms were raised; its waters were so cold and sweet that the people called them the waters of Paradise; but notwithstanding all this the water at times was not good, and the khan with great exertion dug a large surdab of beautiful water. The motto of the date of this reservoir is this: "During the reign of the mighty Alumgeer, whose equity revived the world, Mootamed Khan at his request dug this reservoir. By its waters the afflicted are healed. I sought its date from the wise soothsayers, and I was answered that it 'originates from light.'" The old walls which were on the road that led to the castle and near the bridge, had become so old from the number of those going and coming that the water escaped from them; Mootamed Khan attempted to rebuild them, but in the rainy season a stroke of lightning tore them up, and its waters rushing out destroyed many of the passers-by at the time; the large stones that formed their foundation fell out, and striking against each other from the weight of the water, broke in pieces: the khan ordered them all to be built anew. Although, to all intelligent and enlightened people, it is manifest that God is the only author of all events, yet the Hindoos, who had an idol temple near this reservoir, attributed its falling in to this reason—that their idol gods were annoyed that infidels should pass so near their habitation, and that their gods had in anger destroyed it. The Hindoos were greatly pleased at this, and spread rumours to this effect, which reaching the ears of Mootamed Khan, he instantly ordered the idol temple to be pulled down and a mosque raised in its stead: all the Mohammedan passers-by stop to pray there. The motto of its date is this: "In the glorious reign of Alumgeer, whose existence is like the moon at its highest; thanks be to God that this blessed spot was built by the bounty of Mootamed Khan. The castle of Gwalior is beautified by this building, which is a representation of Paradise. The enlightened khan who has endeavoured to proclaim the glory of God, destroyed the infidels' temple. Heaven and earth praise Him; the light has dispelled the darkness of the impious. Hatif says, 'May this light ever remain a blessing!'" He then ordered the reservoir to be built anew; it is now in perfect repair and full to the brink. In the quarter of the town called the *Pigeon House* he built another reservoir; it is impossible even to imagine its depth: its four sides were so strongly built that they could have kept an ocean within their bounds; it was named Noor Sangir: the motto of its date is this: "In the glorious reign of Alumgeer, whose justice revived the world, the enlightened Mootamed Khan dug this reservoir. I asked the soothsayers its date; Hatif said, 'It is the well of Para-

dise.'" The ancient tank which is near the Shah Jehan-i-Munder had until this time remained in ruins and empty; and although it was excavated in the hard rock, and its waters escaped from constant running, Mootamed Khan, with the permission of Alumgeer, repaired its sides with a very strong cement, so firmly that not a drop of water could escape, and thus made up for the great want of water in that quarter. It was a reservoir that would last to all eternity: the motto of its date is this: "In the reign of the King Aurungzebe, who enlightened the world with his presence, from the exertions of Mootamed Khan this tank was converted into a pure and refreshing well. Hatif says, 'Welcome is its name, Aurungsankir.'" It is wonderful to relate, that the jessamine flower was found in abundance, and of the rarest quality, on these hills; on this account Mootamed Khan laid out meadows on every fertile spot, and dug tanks in them with *jet d'eaus* in the centre, around which he constructed sitting-places, and planted trees close to them, and laid out lemon beds near them. In fact, the fruits of these gardens were so delicious, that quantities were presented to the king, who was particularly delighted with its sweet grapes, of which a large supply was constantly sent to him. The melons of this place were very large, and comparable in taste to the Koreez melons. The khan used, by way of joke, to amuse his visitors by weighing them in their presence; they often exceeded in weight twenty-one seers. Shah Jehani, the water-melons were very well flavoured, and of an enormous size; every tree brings forth fruit and blossoms, according to the attentions and good-will bestowed on its rearing by the planter. He made many new alterations in the castle, such as raising troops of spearmen to the number of 2000 or 3000, well calculated to be of great use on the day of battle with his enemies; they were also useful in guarding the tower walls during his absence with the other troops. It is well known to our readers that the castle of Gwalior was founded by the ancient rajahs. During their governorship the Mohammedan religion was not known, until it fell into the hands of those great emperors, who were strict promoters of the true faith. During the period that the rajahs were governors of the castle, and bore a name in India, the castle, by the orders of the great emperors, was given up to them entirely as a residence for their tribe; on this account the Mohammedan laws were not strictly adhered to, but their power lasted but a short time before the final establishment of the Mohammedan power, since which event the Mohammedan law and customs were soon firmly established everywhere. All their governors who were sent to command the castle were strict promoters of their faith, and thought it a virtue in the sight of God to build and repair their mosques to the utmost of their power. The castle was so beautifully laid out that it would bear a comparison to Akberabad, and the other large towns near it. It was also a central position on the road between the northern provinces, as well as from Iran and Sonan; travellers of all nations stopped here.

But as in the whole city there was no lofty mosque that from its height might attract the piously inclined to pray and collect there, Mohammed Khan was determined to erect one; he selected a piece of ground for this purpose near the Choke Bazaar, a very suitable spot, on which he commenced the foundation of the mosque, and raised lofty chambers one upon another; over them he built lofty domes: he also built a mihrab, where the pious might pray successfully, and at each corner of the domes he raised minarets towering to a lofty height. In the centre of this temple he constructed a tank, filled with the purest water, in the centre of which a *jet d'eau* was constantly playing; around the tank he built stone benches, that those performing their ablutions might, after stooping, rest themselves. Opposite the tank stands a lofty gate, over which a large chamber; on each side of this gate he constructed two other handsome gates, which were surrounded by a verandah. Besides these erections he built another large reservoir, which he named after his son Jemalserver; its sides were strongly formed of hard cements; from these tanks he dug small canals of water, so that their water might always remain clear. The waters of these tanks were similar to the waters of Paradise; all living creatures were benefited from its sweetness; whoever tasted one drop forgot the pangs of death. In the reign of the victorious Emperor Aurungzebe, whose justice and equity ruled the seven quarters of the globe, who was a unique monarch ruling over a splendid empire, a glorious emperor, a commander of vast armies, through his example Mootamed Khan carried wisdom, was esteemed by the king, and favoured by God. Mootamed Khan had a son, whom he esteemed more than all the world's riches. By God's will they named him Jemal Athur; this auspicious person, favoured by the Almighty, built a reservoir comparable to the waters of Paradise. Its waters were so pure and clear that you would believe the cloud that had rained them had been a brilliant diamond. On searching for the date of its building, Hatif said, "May *he* always remain prosperous in his kingdom!" About this time the khan received a letter from the king, in which he was ordered to resign the governorship of the castle, and the care of the prisoners, such as Mohammed Sultan, Seper Shookooh, and Seyed Buksh, to Hajee Pool; that he himself must come to Aurungabad. The khan, on receiving these orders, left the castle, and encamped on the banks of the reservoir of Jemal Server. He remained there one day; at the end of his second stage he stopped at the garden of Jemal Boree, which is close to Moorabad, and about seven koss from Gwalior. Here he remained two days, from whence he wrote to the emperor, begging leave to be allowed to see him, and started with that intention on the 24th of the month of Shaban, in the year 1078 of the Hegira: he reached the capital Shahjihanabad, and was honoured by an interview with his majesty, and his majesty conferred all manner of attentions and respect upon him. In the 15th year of his majesty's reign a splendid banquet was prepared in honour to him, and he was presented with one lakh of

rupees in jewels, and ten elephants adorned with massive gold chains —the emperor only took five of the chains. As the khan had been a long time separated from the emperor, he begged to be allowed to remain near his majesty in Shahjihanabad, and was permitted to resign his appointment as governor of Aurungabad. The name of the author of this insignificant work is Heeramun, son of Giderdass Moonshee. Although I have passed my life in a humble situation, I have had the satisfaction of praying for the increasing greatness and power of this good khan. May the great God grant my desires! Thanks are due to that God who has brought these writings to a happy conclusion.

TIDES.—*Tables containing a Record of a Series of Observations on the Tides in Bombay Harbour from* 1835 *to* 1840. *By* Captain Ross, *President of the Society. With some Preliminary Remarks by* Dr BUIST, *Secretary.*

In publishing the following tables of observations on the tides, conducted through the space of five years without interruption, under the supervision of Captain Ross, master-attendant, Bombay, and President of the Geographical Society, it has been considered expedient to preface them by some general remarks; not with a view of communicating anything new or original on the subject, but in the hope of promoting the spirit of inquiry amongst observers in the East, who, deprived of access to public libraries, and very scantily supplied with books of their own, may require to be enlightened on subjects familiar to many classes of persons at home, who make no pretensions to eminence in literature or science.

The number of facts collected beyond the confines of Europe on the subject, is so exceedingly small, compared to the amount which it would be desirable to obtain, to permit a sufficient correction of the tables supplied by theoretical computation—the importance of collecting information so great, and the facilities for doing so in many cases so abundant, in proportion to the extent to which they have been taken advantage of, that any remarks, however void of novelty or depth, which may conduce to the improvement of our knowledge, must be looked on as not unworthy of dissemination. No greater discouragement can be experienced by the ordinary observer, at the commencement of a laborious series of inquiries, than the feeling of uncertainty as to what may be already familiar to the world in general, and what really requires to be known—than to doubt, in addition, as to whether the mode proposed to be adopted for conducting the intended investigation is really that most suitable for the end in view, or most generally approved.

If either source of perplexity should stand any chance of being

removed by the following outline; if any one ignorant of the limits which define the extent of the field of our knowledge should feel his conceptions on the point more precise than before, and thereby be encouraged to exert himself to place new facts in our possession; or should find difficulties which previously presented themselves as stumbling-blocks in his way, removed, it is hoped the space devoted to them in the Society's Transactions will not be considered thrown away.

Tides generally occur twice in the course of a lunar day, or 24h. 49m. of mean solar time. The whole interval between high and low water is called a *tide;* the water is said to ebb and flow—the rising is called the *flood*, and the falling the *ebb tide.* Tides are exceedingly variable in their height at Bombay—the greatest is nineteen feet, the least about ten feet: these succeed each other in regular series, diminishing from the greatest to the least, and increasing from the least to the greatest.* The spring tides, the greatest of these occur betwixt one and two days after full moon; and the neap tide at a certain interval after the quarter. The interval between two succeeding high waters is variable. It is shortest about new and full moon, being about 12h. 19m. About the time of the moon's quadratures it is 12h. 30m. The tides, in similar circumstances, are greatest when the moon is in the equator or in her perigee, and least when she is in apogee, or farthest from the equator.

In certain places, as on the east coast of Scotland, there are four tides in a day; in others, but one. The great tidal-wave raised in the Atlantic Ocean throws off a branch towards the North Sea. Part of this rushes through the English Channel by Dover; part finds its way by the Pentland Frith: the latter is the principal of these, and furnishes the main tide as far south as the river Thames, occupying twelve hours in its transit from Aberdeen to London—the tide of noon at the former place being that of midnight at the latter. At Leith they succeed each other at an interval of about an hour—or, more properly speaking, of thirteen hours; the one being the noon, and the other the midnight, Atlantic tide. Here they nearly neutralise each other.† The same thing on a smaller scale is found to prevail on the coasts of Galloway and Lancashire; it is caused by the rush of the two contending branches of the same wave—the one up the Bristol Channel, the other round by the north of Ireland. The wave which enters the German Ocean betwixt the Orkneys and Norway, sends a southerly detachment along the coasts of Britain, which is reflected from the projecting coast of Norfolk upon the north coast of Germany, and meets the tide-wave again on the coast of Denmark. Owing to the interference of different tide-waves the tides are almost entirely obliterated on the coast of Jutland, where their place is supplied by nearly perpe-

* The chief portion of this part of the above paper is abridged from the Article Tides in the "Encyclopædia Britannica," seventh edition, vol. xxi., part I., pp. 259 to 279. The other papers which have been taken advantage of are quoted as they come to be drawn upon.

† Scott Russell's Report before the British Association.

tual high water. Indeed, this must always be the case where one tide arrives about six hours later than another, or where more tide-waves arrive at still shorter intervals. At Aden, the tide is sometimes for a period of days interrupted altogether; sometimes high-water occurs at one side of the peninsula, while it is low-water at the other—though the distance betwixt the two sides is less than three miles.

Were the surface of the earth uniformly covered with ocean, the tides would follow the moon from east to west; one long wave extending from pole to pole—so that it would be high-water at the same time throughout the entire length of each meridian. This is far from being the case in reality; the appearance of tides at different places, under the same meridian, occurring at very different hours, and being modified in every imaginable way by the form of the continents and islands by which the great tidal-wave is obstructed or deflected from its course. The nearest approach to coincidence betwixt theoretical deduction and observed fact, occurs in longitude 55 deg. 56 min. E., high-water taking place nearly at the same time in the same longitude, from Socotra to the Almerants and Isle of Bourbon. The southern extremity of the line advances as it passes the Cape of Good Hope, so that it there turns up towards the Atlantic, which it enters obliquely, so as to arrive nearly at the same moment at the Isle of Ascension and at the Isle Martin Vaz, or the Trinity. After several irregularities about the Cape Verd Islands and in the West Indies, the line appears to run nearly east and west, from St Domingo to Cape Blanco, the tides proceeding due northwards; and then turning still more to the right, this line seems to run north-west and south-east, till at last the tide runs due east up the Bristol Channel and round the north of Scotland, sending off a branch down the North Sea—the two waves meeting, as already explained, along the eastern shores of Britain. The tides in the northern parts of the Indian Ocean are subject to very great irregularities, affording the singular phenomenon in the port of Tonquin of one tide a day. The tides at Aden, in the Arabian Sea, are, as already stated, still more anomalous than even this, several days sometimes occurring in succession when permanent high or low water is maintained: this seems in part dependent on the direction of the monsoon, the water rising on the one side or other of the peninsula according as the currents impelled by the winds sweep across from the shores of Africa, or set along the Arabian coast.* Considering how

* This is stated on the authority of Lieut. Curtis, resident engineer at Aden. It is singular that this peninsula should now have been nearly six years in our possession, and though two or more ships of the Indian navy are constantly stationed there, with some 80 or 100 intelligent army officers as residents, that we should, up to this date, be in possession of not one page of authentic material in reference to its natural history or geography. We know something of its climate from the observations of Corporal Moyes of H.M.'s 17th. Of its hydrography we know nothing. Colonel Grant and Major Jacob, after having expended nearly four months in surveying the line of fortifications at Aden, found themselves without any information as to the climate of that peninsula, or of the rise and fall of the tides upon its shores.

important it is for the purposes of commerce, that the depth and rise of tides should be predicted with accuracy, it might have been expected, when Newton had furnished the theory for general explanation, that immediate attention would have been directed in the maritime ports of all civilised countries, to obtain, if possible, such an acquaintance with the actual state of tides, as with the aid of theory might have subserved, as far as possible, the purposes of the practical navigator. So far from this having been the case, the subject for more than a century appears to have been in a great measure lost sight of. Mr Lubock's examination of the tide observations regularly recorded at the London Docks so late as the year 1829, first fairly recalled attention to the subject; while the labours of Mr Whewell, and the encouragement and pecuniary assistance afforded by the British Association for 1833, at length fully aroused public interest.

The first memoir on the subject, entitled an "Essay towards a first approximation to a Map of Co-tidal Lines," appeared in the Philosophical Transactions for 1833. By a co-tidal line is meant, such a one as may be drawn through all those points of ocean which have high-water simultaneously. The co-tidal line of any hour may be considered as representing the summit or ridge of the tide-wave at that time; meaning by the tide-wave, that protuberance of water upon the surface of the ocean which moves along the sea, and by its motion brings high-water and low-water to any place, at the time when the elevated and depressed parts of the watery surface reach that place. The co-tidal lines for successive hours, represent the successive positions of the summit of the wave: so that, if a spectator were detached from the earth to perceive the summit of the wave, he would see it travelling round the earth in the Southern Ocean once in twenty-four hours, accompanied by another wave twelve hours distance from it, and both sending branches into the narrower seas; and the manner and velocity of all these motions will be assigned by means of a map of co-tidal lines. By analysing the movements of the tides according to the most simple consideration of the laws of fluid motion in open seas and in channels, and by explaining the circumstances of convergence and divergence—their interference with each other—their retardation in shallow water—and their consequent tendency to sweep around the coasts and to approach them almost perpendicularly; and further, by discussing very carefully all the materials with which all the books of navigation could furnish him,—Mr Whewell was enabled to construct a map, which not only represented the general circumstances of the tides on the coasts of Britain, but likewise, as he supposed, of the movement of the great tidal-wave from the Southern Ocean to the coasts of Europe through the Atlantic; as also its progress in the Indian seas, and on the coasts of New Zealand.

Such has been the importance attached to the investigations of Messrs Whewell and Lubock, that they have been distributed through not fewer than ten volumes of the Philosophical Transactions, (from 1831 to 1842.) It is not necessary here to enlarge more extensively on the

subject. The following directions, forwarded by Mr Whewell to the Asiatic Society, Calcutta, with Mr Prinsep's introductory remarks, will indicate to the tropical observer the points on which it is desirable to obtain information :—

SEMI-MENSTRUAL INEQUALITY OF THE TIDES.

[We hasten to publish the following letter from the Rev. W. Whewell of Cambridge, in correction of a quotation from the learned Professor's Essay on Co-tidal Lines in our editorial notice of Mr Sinclair's tables of the Calcutta tides, in the third volume of the Journal, p. 408. We regret that the period fixed for the contemporaneous observations on the shores of England should have passed; but we once more repeat a request to our friends on the coast to furnish the information now called for.—ED.]

In the number of your Journal for August 1833, is given a table of the times of high-water at the principal places between Calcutta and Point Palmiras, by Mr P. A. Sinclair; an addition to our previous materials for a map of Co-tidal Lines which I saw with much pleasure. But I am desirous of removing a misapprehension which I perceive in the remarks accompanying this table. Mr Sinclair has given the time of high-water for every day of the moon's age, at the places contained in his table, calculated on the supposition of a daily retardation of the tide, to the amount of 48 minutes: and in the remarks a rule is quoted from my paper for the correction of the time so given. But the rule quoted is erroneous for the purpose there stated. The rule which should have been given is the following nearly.

Correction to be applied to the time of high water calculated by supposing it to be always at the same interval after the moon's transit as it is on the days of new and full moon.

Time of moon's preceding transit, hrs.	0	1	2	3	4	5	6	7	8	9	10	11
Correction, . . . minutes,	0	−16	−31	−46	−61	−72	+75	+65	+34	0	+13	+11

The fact is, that the correction quoted from my paper belongs theoretically to the "correct establishment," or mean of all the intervals of moon's transit and tide, not to the "vulgar establishment," or interval of moon's travel and tide on the day of new and full moon, which is the establishment taken by Mr Sinclair.

The correction which I have given above is probably not exact for India, for it is taken from the London tide observations; and it would be extremely desirable, as you have observed in your Journal, to verify or correct it by observations at some stations in the Indian seas, made daily for a sufficient length of time. I may add, that the above correction is what has been called the *semi-menstrual inequality*, and does not arise from the inequality of the moon's daily motion, but from the varying angular distance of the moon from the sun, in consequence of which the solar tide sometimes coincides with the lunar, and at other times is separated from it by a large angle.

I am very glad to find you expressing your hope that you will be furnished by your correspondents with tide observations from an extensive range of places in India. I would observe, that for the purposes of science, the daily observations themselves are much more valuable than the "establishment," or any other inference collected from them.

In conclusion, I would beg particularly to state, that directions have been given for tide observations on the whole coast of England from the 9th to the 22d of June in this year: that I have strong hopes that these observations will also take place on the shores of other states of Europe and America at the same time; and that it would be very interesting and useful to have contemporary observations made on the shores of India at as many places as possible.

March 21, 1835.—*Bengal Asiatic Journal for Sept.* 1835.

DEAR SIR,—The Asiatic Society having been requested by its patron, the Right Honourable the Governor-General, to draw the attention of those of its members who

may be resident within convenient distance from the sea coast, to the desiderata published by the Rev. Professor Whewell in 1833, regarding the phenomena of the tides, I have been directed to prepare the accompanying copy of the Professor's suggestions for circulation, and to address them to those of the Society's associates and correspondents, whose zeal in the cause of science furnishes an assurance that they will cordially co-operate in obtaining the information required.

As regards the tides of the Indian Ocean, the principal points to be ascertained are,—the exact times of the arrival of the tidal-wave (*i.e.*, the times of high and low water) at several stations on the east and west coasts of the Bay of Bengal, simultaneously observed for one or more lunations—or if practicable for a whole year. If to this information can be added the *tide-lift*, or difference in perpendicular height between high and low water, obtained by means of a pier or a post set up for the purpose, the utility of the register will be much enhanced. The direction and velocity of local currents caused by the tide, with note of the prevailing winds and their action on the tides or the currents, will also be valuable additions.

It is particularly desirable to note the difference of the tide-lift in the two tides which occur within the same twenty-four hours, to serve as data for calculating what has been called the diurnal irregularity, a phenomenon now discovered to be dependent on the declination of the moon north or south of the equator, but which has not hitherto been regarded in any of the published tables of the daily tides, although the differences thus caused are of great magnitude, and are of material importance in the navigation of rivers and shallow seas.

In noting the time, it should be stated whether apparent or true time is intended; and if the time of the moon's passage over the meridian is mentioned, it will be a means of checking the rate of the clock.

Those gentlemen who may not be able to take observations themselves, from the situation of their houses or other causes, may frequently be able to instruct and employ a classy or servant to note daily the most simple and essential points, the time and height of high-water.

By way of insuring results as comparable as possible, the months of July, October, January, and April are selected, commencing with the new moon first occurring in each:—but it is by no means intended to restrict observations to these months as any full period of a lunation will give information whence what is called, "the tidal establishment" of a port may be deduced.

The Society has no intention of imposing a pecuniary tax on those who are willing to lend their aid in the prosecution of these inquiries. I am therefore directed to request that you will oblige me with a note of any trifling expense to which they may lead, relying with confidence on your judgment and discretion to effect the object as cheaply as possible.

I have the pleasure to remain,
Dear Sir,
Yours very faithfully,
J. PRINSEP,
Secretary.

ASIATIC SOCIETY'S APARTMENTS, *7th June* 1837.

SUGGESTIONS FOR PERSONS WHO HAVE OPPORTUNITIES TO MAKE OR COLLECT OBSERVATIONS OF THE TIDES.

It was shown by Newton, nearly 150 years ago, that the fact of the tides and several of their circumstances resulted from the law of the Universal Gravitation of matter. But in this interval of time scarcely anything has been done which might enable us to combine into a general view the phenomena of the tides as they take place in all the different parts of the world; and at very few places have good and continued observations been made and published. It is

conceived that by collecting such observations as have been made, or may easily be made, the connexion and relation of the tides of all the parts of the ocean may be in a short time clearly made out; and that persons may be induced to make such careful observations as may serve to be compared with the theory. In this hope the present paper is circulated.

The most useful observations with reference to our general knowledge of the tides are the following, beginning with those which are most easily made:—

1. The observation of the time of high-water at a known place on any day, and especially at new and full moon.

2. The observation of the time of high-water on several days in succession at the same place.

3. The observation of the height of several successive tides at the same place.

4. Observations of the comparative time of high-water on the same day at different places in the same seas.

1. An observation of the TIME of high-water at a given place on *any* known day may be useful.

If the time of the *moon's southing* on the same day be noted, this will facilitate the use of the observation, and will furnish an additional evidence of the correctness of the date.

The time of high-water on the days of *new and full moon* is more particularly useful than on other days.

Observations of the time of high-water may be made with sufficient accuracy without a tide-post. A place ought to be selected where the water is tolerably smooth.

2. If there be opportunity at any place, it is desirable to observe the time of high-water *every day for a fortnight.*

If it be ascertained that the two tides on the same day occur at regular intervals, *one* of them only need be observed.

But there are often irregularities in the relative times of the morning and evening tide; and these irregularities are different for different ages of the moon. In this case *both daily tides* should be observed.

3. A single observation of the height of the tide is not of much value. But a *series* of heights *for a fortnight* is valuable, especially if accompanied with observations of the times.

The morning and evening tides are often unequal, and this inequality sometimes varies considerably from one fortnight to another.

In observations of the height of the tide, the *difference of high and low water* ought to be taken.

The channel of a river is *not* a good situation for such observations.

4. The usefulness of tide observations will be greatly increased if those made at places in the same seas can be compared so as to show the RATE *at which the tide-wave* TRAVELS.

For example, the time which it employs in passing along a certain line of coast, or across a sea, or round an island, or up a bay.

N.B.—The tide-wave is the elevation of the waters by which high water is produced in many places at once. It is not observed as a visible wave, but is found by drawing a line upon the globe through all the places at which it is high water at a certain moment. The rate and direction of its travelling are known by comparing the position of such lines at successive times.

N.B.—The RATE *at which the tide-wave* TRAVELS is quite distinct from the rate at which the stream of ebb or flow *runs.*

N.B.—Also the DIRECTION in which the tide-wave travels is quite distinct from the direction in which the tide *ebbs or flows.*

The most proper observations for determining the rate and course of the tide-wave are those of the time of high-water *on the same day at different points* (not too near nor too remote) on a continued line of coast or sea.

This may often be done by a person residing in any country by making in-

quiries of persons conversant with the coasts, or by directing corresponding observations to be made at different places for a few days only.

If the places differ much in longitude, this ought to be noted, that allowance may be made for the difference of the absolute time of noon.

If there be any uncertainty as to the rate and course of travelling of the tide between two places, the doubt may best be removed by obtaining observations at some intermediate point or points.

It is necessary to distinguish the time of high-water at the *mouth* of a deep bay or sound, from the time of high-water further in. The former is to be taken in all such comparisons as are here spoken of.

Large islands and long promontories much disturb the regular progress of the tide-wave.

Comparative observations of the *height* at different places in the same seas, especially if combined with those of the times, may also be of great value.

All communications concerning any observations of the above kinds made or to be made in any part of the world will be thankfully received. They may be addressed to the care of the Secretary, Asiatic Societies of Calcutta or Madras, or direct to the Rev. W. Whewell, Trinity College, Cambridge; or, at the Royal Society, London; or the Astronomical Society, London.

The observations recorded in the following tables were made at the Dock-head in Bombay, where the tide-wave, rushing along from the equator to latitude 25° north, sends off branches to the eastward through the estuaries and creeks abounding on the Malabar coast. The inlet which constitutes Bombay Harbour runs nearly north and south. Opposite the docks it is about seven miles across; it narrows to a point as it approaches the mainland, and is about twenty miles in length from where it is at first closed in by the island of Caranjah on the one side, and the rocks off Colabah Lighthouse on the other, and Trombay, where it winds away in a narrow creek amongst the islands. The observations were made by a lascar, or native sailor, under the department of the master-attendant, Captain Ross, who has expressed considerable hesitation as to their accuracy. Their correctness as to matter of depth may be pretty confidently relied upon; but it is by no means certain that high-water was noticed when the tide first reached its maximum, or that any rule has been very regularly observed in reference to the period of time for making the observations. It is proper that this source of possible inaccuracy should be kept in view, though it is believed the observations at Bombay are altogether as minute and trustworthy as those on which Professors Whewell and Lubock have founded their speculations.

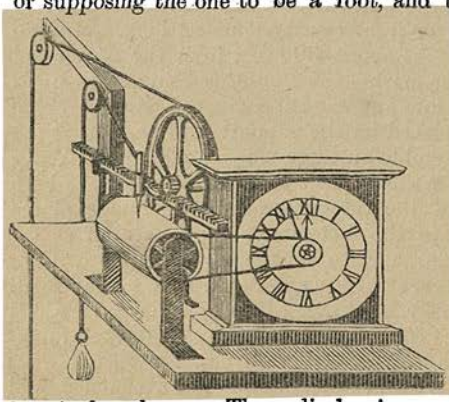
Shortly after the erection of the buildings for an astronomical observatory at Colabah, it was resolved that a series of tidal observations should be commenced in the neighbourhood, on a much more perfect system than that which the state of the master-attendant's establishment or the position of the Government dockyard permitted. At this time nothing was known of the self-registering tide-gauges, since introduced at home; and a very simple and ingenious contrivance, by

means of a large float and pulley, was suggested by Captain Ross for the purpose in view. Opposite the Observatory, the sea occasionally recedes a distance of nearly 700 feet from the nearest point on the shore where a gauge could be erected. A well 22 feet deep, and 18 by 10 in area, with a neat register-house over it, was constructed just above high-water mark. It was at first proposed to connect this with the sea at low-water, by means of a syphon-shaped pipe—an idea unfortunately afterwards abandoned. It was next suggested, that water should be admitted by an open cut through the rocks, and about 2000 Rs. were expended in endeavouring to have this executed. It was speedily found, as might from the first have been anticipated, that in the first place, were it practicable to make such a cut as was desired, it would to a certainty be choked up every year with sand and gravel during the south-west monsoon. A more formidable objection than even this was found in the fact, that unless by the use of a coffer-dam or diving-bell, the excavation of a cut, to admit the sea at all times, could, as it approached the line of dead low-water, only have been worked at for half an hour or so at a time for one or two tides a year; so that its completion would either have incurred an unwarrantable amount of expenditure, or occupied an infinitude of time. The work, therefore, was abandoned, and that which had been completed left unserviceable for the ends desired to be attained, after everything was supposed nearly ready for the work of observation. In this state were matters found when the present writer was placed in charge of the Observatory in July 1842—a beautiful self-registering tide gauge, with all appurtenances, then lying unemployed amongst the unserviceable instruments of the establishment. Government having been applied to, at once gave a general sanction for the resumption of operations. The difficulties of the plan, which had already so far been acted on, were apparent; and the following was suggested in its stead. Four stout supports of wood or iron, twenty-four feet long, were proposed to be made fast in the rocks about 300 feet from the shore, and sixteen or so below high-water mark—their position being at all times accessible from the shore at low-water neap tides. A strong framework and platform was to be placed on the summit of these, so that the whole erection would have resembled a huge four-legged stool. Above this a wooden structure like a closed-up sentry-box was to have been erected for the machinery of the tide-gauge. A wide pipe placed vertically from the platform to the bottom of a pit as deep as the lowest level of the lowest tides, and to be supplied either by a cut or syphon-shaped pipe, was to serve the purpose of a well for the float. Plans and specifications to this effect having been given in and acceded to by Government, difficulties from position of the structure, and danger from the violence of the waves, began to occasion such serious apprehensions of failure, that the original scheme was abandoned, and a new one drawn up and submitted. As this is the one which has been sanctioned, and is now in process of being carried into effect, a

somewhat minute account of it may prove of interest, as on its indications will probably be founded future speculations on the characteristics of the tides on this portion of the Malabar coast.

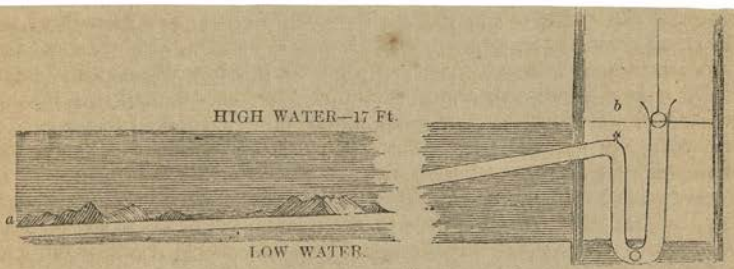
To make the explanations about to be offered more intelligible to the reader, a short account may, by anticipation, be given of the self-registering tide-gauge intended to be put in operation, and for the use of which some such arrangements as those about to be described were found essential.

The object of the very ingenious and simple machine proposed to be described is to obtain a minute and precise record of the depth and of the rise and fall of the tide at every hour and minute of the day, without further attendance than that required for renewing, once in 24 hours, the sheet of paper on which the information desired is to be recorded .The first thing, of course, is to have a well or recess into and from which the sea-water may find access and egress at all times of the tide—sufficiently isolated not to suffer perturbation from the agitation of the wind, or undulation of the waves. A float of considerable weight is immersed in this, with a counterpoise to prevent its descending below the surface. The string connecting the two passes over a sheve or pulley from a foot to a foot and a half in diameter, and this of course is carried round to the right or left, according as the float rises or descends by the buoyant action of the rising or falling tide. On the axle of the pulley is a pinion of about half an inch diameter, the teeth of which are fitted to those of a rackwork bar, to which an arm holding a pencil is fastened. It is obvious that, if a sheet of paper were placed under the pencil, and the parts of the machine already described put in motion, a tracing would be obtained of the height of the tide, on a scale bearing the same relation to the actual rise and fall that the circumference of the pulley does to that of the pinion: or supposing the one to be a foot, and the other half an inch, in diameter—a tide of eighteen feet which turned the pulley six times round would make the rackwork and its pencil, carried along by the pulley, trace a line nine inches in length. To accomplish the whole task, then, the paper must be moved forward by clockwork; and the simplest plan of accomplishing this is to fasten it round a wooden cylinder connected with a timepiece, which causes it to revolve once in twenty-four hours. The cylinder is one foot long and three inches in diameter, so that a sheet of paper one foot by nine inches rolled round



it and placed under the pencil, will receive a tracing of the fluctuations of the tide for the space of twenty-four hours. The sheet of course must be divided by twenty-four lines running parallel to the axes of the cylinder, corresponding to the hours of the day and night, and by other lines at right angles to these running round its circumference, denoting the height in feet and inches to which the tide has risen. A combination of the two movements will trace an undulating line corresponding in appearance to the actual tidal wave which is meant to be represented. The process of replacing the successive sheets of paper, daily withdrawn, may be performed by any one, however unintelligent or ill-informed, if he has once been shown how to fix the pins. Nor is precision in point of time at all requisite, as the portion of the curve amissing on the one sheet will always be found on the other. The machine only costs, I believe, about £10.

To return to the description of the Bombay tide-gauge and its arrangements. The idea of a continuous cut by which the sea should, at the lowest low-water-mark, find access to the well intended for the reception of the float, having been abandoned as impracticable, that of a syphon pipe* was resorted to. The longer limb (*a b*) to be laid some feet under the mass of gravel with which the original cut had by this time become filled up, and so secured as to be safe from the action



[The sketch is broken in two by a shiver in the cut to save space in printing.]

of the waves. On reaching the edge of the well, originally completed as already stated, it turns suddenly at right angles, descending a foot below the level of the lowest known low-water-mark, when turning abruptly up again it is widened out, and so is continued to two feet above the highest known flood. It will be seen that the vertical limb of the double syphon now comes in place of the well for receiving the float—the self-registering apparatus already described being placed right over the open mouth of the pipe. There were three points on which Government entertained apprehensions of the efficiency of the contri-

* I was not at all aware till long after the plans had been sanctioned by Government, that the syphon had been originally projected; nor of the fact afterwards discovered, that tide-gauges with syphon pipes as feeders to the float-well existed at home. There is, if I mistake not, one of these in use at Plymouth.

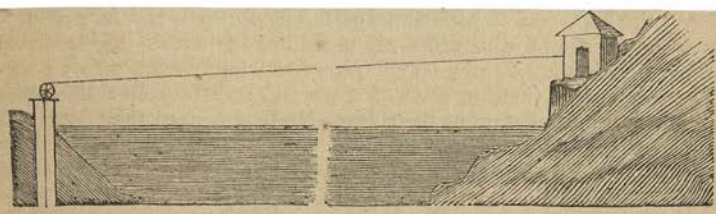
vance just described, and these were referred to a committee, consisting of Captain Ross, master attendant; Captain Turner, mint engineer; and Dr Buist. The first was, that the fairway of the pipe might get choked with shell-fish:—the remedy suggested for this was, in the first place, the erection of a considerable pile of loose stones at the lower terminus of the pipe, to which shells might adhere in preference; and, second, should they make their appearance, it was suggested that they might be got rid of by plugging the pipe and filling it for a day with lime water, water from coal tar, or any other solution likely to prove poisonous to them, but not injurious to the iron. The next two were: first, the risk of the lower limb of the syphon getting choked with mud—a danger obviated by a common cleansing cock or plug; the second, that of the accumulation of air in the upper limb—a risk obviated by a small air cock opening with a float every time the knee was covered by the tide. The propagation of the undulations occasioned by the ordinary waves above the extremity of the pipe is easily prevented by narrowing the aperture by which the water is admitted. On these apparent difficulties being explained away, Government at once acceded to the carrying out of the project, which has only been delayed in consequence of the deficiency of engineer officers at the Presidency for the emergencies of the routine of service.

The pipes, which are of cast iron, four inches in diameter, and united by socket-joints, have at the present date (July 28, 1844) been provided, and will probably be laid down so soon as the season permits; and it is to be hoped, that before the setting in of the hot weather a series of observations, worthy in point of minuteness and frequency of the importance of the subject to be inquired into, may be in progress, in connexion with the other investigations in which the Colabah Observatories are engaged.

The Colabah Building Company had at one time in contemplation the erection of a tide-gauge at their pier similar to that at the Observatory, but about two miles farther up the harbour; and though the execution of the project has for the present been postponed, it is hoped it will yet be resumed, and that by and by we may see tidal observations in progress all round the island, and in the creeks and entrances on the mainland adjoining. The very great irregularities which prevail so near us—as at Mahim, Tannah, Panwell, and Nagotana—places all within thirty miles of us, and constantly frequented by the inhabitants of Bombay, taken in connexion with our utter destitution of information concerning them, are frequent sources of the greatest inconvenience in the construction of public works, and more especially in the movements of troops and stores. The erection of a few self-registering tide-gauges, costing less altogether than the loss incurred by the want of them amounts to in a single year, would, under the supervision of a custom-house officer, in correspondence with the officer at the Observatory, give, in a couple of years, all the information that is desired. The lighthouse at Minora Point, at the mouth of the Indus, would

afford an excellent station for a gauge for determining the state of the tides along the shores of Scinde; while another at Mandavee, a third at Pore Bunder in Goozerat, and a fourth at the mouth of the Taptee, near Surat, would connect the chain of observations from Bombay, along the line where tidal anomalies seem most to prevail in our neighbourhood, and over which, from the extent to which commercial intercourse prevails, it would be most important to have the matter investigated.

A pipe from dead low water to the shore, though necessary at Bombay, is not at all in every case essential. At Aden, for example, so far as I am able to judge of the nature of the coast from charts and a cursory general inspection, a vertical pipe, to serve the purpose of a well, might be made fast to some of the rocky islets which abound near the beach—a tide house for the gauge and clock-work being placed anywhere close at hand that might be most convenient. The float in this, which ought to be a heavy stone or mass of metal, might be connected with the clock-work by a tough and flexible copper wire, such as that made use of by bell-hangers, kept tight, so as not to be influenced by the action of the winds or waves, by a weight adequate to counterbalance the float, intentionally made heavy for the purpose of stretching the wire. By the help of a support every thirty feet or so, a connecting wire of this sort might be extended for some hundreds of yards, without risk of inaccuracy, were the pipe serving as a well made wide enough. Suppose, instead of a pipe, a wooden box three feet square, or cask of similar area, were made use of. An error of an inch in tidal measurement is rarely matter of much consequence: an inch on the float corresponding in diameter to the cask would be equivalent to the displacement of 1000 cubic inches of water, or to a weight of nearly forty pounds. An amount of deflection for which this would be much more than an adequate counterpoise need never be apprehended from any force the wind could exert on a connecting wire with adjuncts such as have been described. The subjoined diagram will, it is hoped, be



[The shiver indicates the portion of the space absent.]

sufficient to make the description intelligible. When the tides are proposed to be registered off a sloping shore, without the use of a gauge regulated by clock-work, a plan such as that now explained might

suffice—the counterpoise to the float being fitted up with a scale at its landward extremity.

Bengal Observations.—The amount of information on the tides of the shores of India is singularly meagre in amount, and incomplete in kind. In the 18th volume of the Asiatic Researches,* a series of observations on the tides of the River Hooghly from 1805 to 1828, with observations on the results thus obtained by James Kyd, Esq., is published. The discovery of Mr Whewell in reference to the difference betwixt the elevation of the day and night tides at different seasons of the year, had not then been made. Mr Kyd had observed the fact: "In the north-east monsoon," says he, "the night-tides are highest, whilst in the south-west monsoon the day-tides are highest. The cause of this I cannot satisfactorily explain. A conjecture has been hazarded, that as in both monsoons the wind is generally higher during the day than in the night, the wind in the south-west monsoon raises the day-tide, whilst in the north-west monsoon the wind during the day withholds and depresses the day-tide; but this is not satisfactory, inasmuch as the wind cannot possibly be uniform, whereas the fact of the higher tides during the day in the one monsoon and during the night in the other is beyond a doubt." "The night-tides in the north-east monsoon are also more uniform in this respect than the day-tides in the south-west monsoon. The horizontal parallax of the moon," says Mr Kyd, "invariably affects the tides—when that is high the tides are high, and *vice versa*, to such a degree of correctness that, allowing for local causes, I could venture to construct a table for a year in advance that should not vary two inches from the actual tides. When the parallax is highest on the second or third day of the full or change of the moon, the highest tide will correspond with those days—as that is the natural period of its greatest height: should the parallax be decreasing, the highest tide will be on the day of full or change; and should the parallax be decreasing and near its lowest, and increase again after the natural period has passed, the highest tide will be on the fourth day after the full or change of the moon. The difference of the effect between the high and low parallax of the moon upon the height of the tides is about two feet, frequently much more; and as its variation as to the time is shown to be four days, this is of importance to all mariners, as enabling them in cases of danger to ascertain by their nautical ephemeris the true state of the tides. No longer need they trust to the partial theory founded thereon of pilots and seamen, most of whom have a notion that the dark spring-tides are always the highest, and that the night-tides are higher than the day-tides; and that the highest

* In the library of the Bombay Branch of the Royal Asiatic Society there is a very complete collection of the Transactions of other Societies; but the volumes are so frequently out for long periods on end, that I have found it impossible to examine them through. There may, therefore, be papers or volumes on which I have been unable to lay my hands, though I should think they could neither be numerous nor important.

tide must always occur on the second or third day after full or change, whereas the parallax of the moon will effectually supersede this uncertainty, and either warn a mariner with his bark on a shoal not to wait till the second day and lose the springs, or save him from despair because these days may have passed, and induce him to wait with confidence till the fourth day after the full or change for the highest tide, as the case may be."* Mr Kyd unfortunately withholds figure tables, but gives very neatly delineated curves in their stead: it would be highly expedient if both were on all occasions supplied. In the "Gleanings of Science" (Prinsep's) for November 1829, a notice appears—a continuation of which is published in the "Gleanings" for January 1830 connected with that of Mr Kyd—of a series of tidal observations made betwixt July 1828 and July 1829, at Mud Point, on the island of Saugor, which gives a considerable amount of additional information in reference to the tidal phenomena in Bengal.

At Batavia, Java, and Samarang, tidal registers were for a long time kept with considerable care. At the first named of these places the tide ebbs and flows but once in twenty-four hours at new moon; at the first and last quarters it ebbs and flows twice. At Batavia the sea rises about three feet at neap, and half as much at spring tides: at full and change it is high-water at noon, and low-water at midnight. In March it is high water at half-past six in the morning, and low water at six in the evening. In the month of June it is high-water at midnight and low-water at noon. In September high-water at nine p.m., and low at nine a.m. At Samarang, at full and change in December, it is high-water about half-past two in the morning, and low-water in the afternoon. In March it is high about half-past five in the morning, and low at six in the evening. In June high in the forenoon, and low in the afternoon. Sometimes the flood lasts the whole day. The tides are very irregular—the range is under three feet.†

Madras Observations.—On the 31st May 1821, a tide-gauge was fixed to the north-east angle of Fort St George, for the purposes of exact observation. Until the 29th July the observations were frequently interrupted; but after that date they were made daily at every tide in every twenty-four hours until the 10th October.‡ I am not aware that any separate register or analysis of the Madras observations has been published beyond those already referred to.§ A tidal register is, I believe, kept at Cochin, and another at Point de Galle in Ceylon. Mr Whewell quotes others made in Surat Roads, the Gulf of Cambay, Gogo, and at Bassadore in the Persian Gulf. I am not aware of any

* Asiatic Researches for 1829, (published 1833,) vol. xviii., part 1, page 266.

† Rushton, second series. The authority is not given.

‡ Prinsep's Gleanings of Science for 1835, vol. v., p. 323; also Rushton's Almanac, second series.

§ This is stated on a very imperfect examination of the Madras repositories. I have only had access to a few of the volumes of the "Journal of Literature and Science."

more in the peninsula of India. The registers kept at Singapore, which are generally referred to as authoritative, and seemed to be continued to the present time, need not here be examined; neither need those in the China Seas, which would lead on a field much too extensive and indifferently explained for the purpose now in view.

Result of the Observations made on the Tides at Madras from the 31*st May to the* 10*th October* 1821, *by means of a Tide-gauge fixed near the north-east angle of the Fort.*

Phases and Age of the Moon.	Time of High-Water.	Surface of the Water below the Gauge Mark.						Difference between High and Low Water.	
		At H. W.		At L. W.		Mean Level.			
	H. M.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
Full and Change .	8 58	5	3¾	7	11	6	7⅛	2	7¾
2d — 16th, . .	9 26	5	1½	8	1	6	7½	2	11½
3d — 17th, . .	10 0	4	7½	7	8¾	6	2⅛	3	1¼
4th — 18th, . .	10 30	4	9½	8	3½	6	6½	3	5¾
5th — 19th, . .	11 0	4	10½	8	1½	6	5⅞	3	2⅜
6th — 20th, . .	11 42	4	11¾	8	2	6	6⅞	3	2¼
7th — 21st, . .	12 12	5	3½	7	11⅜	6	7⅛	2	8¼
8th — 22d, . .	12 30	5	4½	7	9½	6	7	2	5
9th — 23d, . .	1 21	6	1½	8	0	7	0¾	1	10½
10th — 24th, . .	3 6	6	4½	8	0	7	2½	1	7½
11th — 25th, . .	4 45	6	6	8	3	7	4½	1	9
12th — 26th, . .	5 24	6	7	8	5½	7	6⅛	1	10½
13th — 27th, . .	6 25	6	4¾	8	4¾	7	4¾	2	0
14th — 28th, . .	7 11	5	11	8	0½	6	11½	2	1
29th, . .	7 37	5	8¼	8	0¼	6	10⅛	2	4
Average mean level and lift, .		5	6½	8	1	6	10	2	6½

The *Madras Herald* of the 3d June 1835, whence the above table is extracted, remarks that "until the 29th of July, the observations were frequently interrupted; but that after that date, they were made daily, at every tide, in every twenty-four hours; and as there appears some difference in the results obtained from the subsequent period, they are given in the following statement."

Circumstances of the Tides from 29th July to 10th October 1821, *both inclusive.*

Age of the Moon.	Time of High Water.	Surface of the Water below the Gauge Mark.						Difference between High and Low Water Mark.	
		At H. W.		At L. W.		Mean.			
	H. M.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
Full and Change .	8 54	5	4½	8	4½	6	10⅜	2	11¼
2d — 16th, . .	9 24	5	0½	8	4⅝	6	8¼	3	3¾
3d — 17th, . .	9 54	4	11⅜	8	3	6	7⅜	3	3½
4th — 18th, . .	10 24	5	0⅛	8	2	6	7	3	1⅞
5th — 19th, . .	11 0	4	10½	8	1	6	5¾	3	2½
6th — 20th, . .	11 42	4	11¾	8	2	6	6⅞	3	2¼
7th — 21st, . .	12 12	5	3½	7	11¾	6	7⅝	3	8¼
8th — 22d, . .	12 50	5	4½	7	9½	6	7	2	5
9th — 23d, . .	1 21	6	0⅛	8	0⅜	7	0⅜	2	0½
10th — 24th, . .	3 6	6	4½	8	1⅜	7	3	1	8⅞
11th — 25th, . .	4 24	6	6	8	4	7	5	1	10
12th — 26th, . .	5 24	6	7	8	5½	7	6¼	1	10½
13th — 27th, . .	6 18	6	4	8	4⅜	7	4¼	2	0⅜
14th — 28th, . .	6 48	5	10½	8	2¾	7	0⅜	2	4⅛
29th, . .	7 37	5	5	8	1¼	6	9½	2	8¼
Average level and lift, .		5	6½	8	2¼	6	10¾	2	7¾

"Although this statement appears less anomalous than the last, in some respects, it is not so in all; and as the other has the advantage of including the period of the long shore winds and strong southerly currents, it is a better average for the whole season than the last."

BOMBAY OBSERVATIONS.—The earliest record of tidal observations made at Bombay is that drawn up by Mr Benjamin Noton for the year 1832, published in Rushton's Gazetteer for 1842. The phenomenon pointed out by Mr Kyd, as appearing in the Hooghly, to which I shall immediately have occasion to advert in discussing Captain Ross's tables, was very clearly indicated by the tables of Mr Noton: I refer to the difference of elevation in the spring tides occurring during the day betwixt the vernal and autumnal, and autumnal and vernal, equinoxes,—the nocturnal tides being highest by a sixth betwixt September and March; the diurnal ones having the advantage from March to September. A note of the tides at the summer and winter solstices from Noton's Tables will put this matter in its clearest light.

1832.	Tide.	
June, F.M. 13.	Day.	Night.
25	14·0	14·0 Feet.
26	15·6	14·6
27	16·6	14·9
28 Change,	17·0	15·0
29	17·6	15·3
30	17·9	14·9

	Tide.	
Dec., F.M. 8.	Day.	Night.
19	13·3	14·0 Feet.
20	13·3	14·0
21	13·3	15·0
21	13·6	15·0
22 Change,	13·6	16·0
23	13·0	16·0
24	13·0	15·0

The following extract from the Tables by Captain Ross, of the equinoctial tides, will show with what nicety the change can be observed :—

1832.	Tide.		Sept., F.I.	Day.	Night.
March, F.I.	Day.	Night.		Tide.	
16	15·6	17·0 Ft.	21	14·3	13·0 Feet.
17	15·9	17·0	22	15·0	14·3
18	16·0	16·6	23	16·0	15·3
27	16·0	13·6	24	16·3	15·10
28	11·6	14·9	25	16·3	16·0
29	12·9	14·9	26	16·0	15·6
30	13·9	15·0			

Some circumstances, apart from the daily rise and fall of the tides at Bombay, are deserving of special attention. The first of these is difficult to be accounted for: the cause of the second is perfectly understood. At the periods of spring tide a swell or agitation of the water takes place from the last quarter flood to the first quarter of the ebb tide, prevailing over a period of about three hours at the time of high-water, which takes place from the first quarter ebb, extending over a space of about three hours. During the S.E. monsoon it is not so high as to produce inconvenience, but from May to September, when the weather is in part rough and irregular, it gives so much motion to vessels coming into dock, as to cause them, on many occasions, to strike so heavily upon the blocks as to upset them: by the time the tide has fallen three or four feet the sea becomes tranquil and smooth again.

The phenomenon of the difference betwixt the altitude of day and night tides, so conspicuous at Bombay, as to require heavy ships to be docked in the summer time during the day, in the winter time during the night, is now recognised as of universal prevalence all over the world, and is as easily explained as are the primary causes of the tides themselves. An extract from Mr Noton's Tables has already been given as illustrative of this. The following, bearing on the same subject, but in a different form, is from the Tables of Captain Ross, now under discussion :—

	TIDES IN FEET AND INCHES.			TIDES IN FEET AND INCHES.	
1839.	Night.	Day.	1840.	Night.	Day.
Oct.	17·	14·	April	16·9	17·
Nov.	17·3	14·6	May	15·9	16·9
Dec.	17·9	15·3	June	15·	17·3
Jan.	17·9	15·9	July	14·	16·
Feb.	17·3	15·3	August	14·6	15·9
Mar.	17·	15·9	Sept.	16·	16·3

To return once more to the "Encyclopædia Britannica," and give the words of the writer :—

Were the earth wholly covered by water, the diurnal inequality of the heights of high and low water would depend on the semidiurnal transits of the poles of the equilibrium spheroid being alternately north and south of the equator. For example, if the moon had 20° north declination, the tide spheroid would have

one pole in lat. 20° north, and the other in 20° south; and while the earth revolved, a place in lat. 50° north would have the tide which belongs to these two poles alternately; and being 30° from the one pole and 70° from the other, the two tides would be very unequal. On the same principles, in northern latitudes the tide which belongs to an upper transit of the moon should be the greater (of the two on the same day) when the moon's declination is north; when the moon crosses the equator, the difference of the two tides should vanish; when she has south declination, the tide which belongs to her upper transit should be the smaller. The contrary (as to greater and smaller) should be true of the tide which belongs to the inferior transit. The diurnal inequality may therefore be conceived to arise from a wave oscillating in the direction of the meridian, and of which the maximum height comes to each place once in twenty-four lunar hours; the minimum height arriving, of course, at the intermediate twelve hours. For such oscillations the Atlantic and Pacific both afford the most ample scope. If the time of the maximum height of this wave arriving at any port coincide every day with the time of high-water, the alternate high-water being at twelve hours' interval, will be affected alternately with the greatest and least heights of the diurnal wave; and the intermediate low waters will coincide with the mean height of this wave, and will not be at all affected. In this case there will be a decided diurnal inequality in the height of the high-water, but none in that of the low-water. In like manner, if the time of the maximum height of the diurnal wave coincide with the time of low water, the height of low-water will be marked with a diurnal inequality, while the height of high-water will exhibit no such feature. But if the diurnal wave arrive every day at a time intermediate between high and low water, it will raise both the high and the low water which are nearest it, and will depress both the high and the low-water which happen in the other half of the day. Hence both the high-waters taken separately, and the low-waters taken separately, will be marked by a diurnal inequality; and this inequality will be greater for high-water or for low-water, according as the time of the maximum of the diurnal wave is nearer to the time of high or low water.

To give the words of another writer, who makes the subject still more clear :—

4. As time is reckoned by the apparent motion of the sun, the solar high-water always happens at the same hour at the same place, but as the lunar high-water, which is the greater, and gives a character to the whole, happens about 48½ minutes later every day, it must separate eastward from the solar high water at that rate, and gradually become lower and lower till at the end of the first and third quarters of the moon, it fall on the same place with the low water of the solar tide. Then the elevation of the high water, and the depression of the low, will be both, only the difference of the solar and lunar tides and the tides will be *neap*.

During the first and third quarters of the moon, the tides will *fall off* from the spring to the neap, and during the second and fourth quarters they will *grow* from the neap to the spring.

5. The obliquity of the earth's annual path round the sun causes the sun, in summer, to appear over our latitudes, nearly 47 degrees farther north than in winter: and the obliquity of the moon's monthly path may make the new moon about 5 degrees more either north or south of the sun; and also vary the full moon to the same number of degrees from the point opposite to the sun. Those changes produce what may be called the *seasonal* variations of the tides. They take place thus :—

a. About the *equinoxes*, in March and September, the sun is near the equator, and the moon, at the time of the spring tides, cannot be many degrees from it; therefore, the tides are then highest and most uniform in both hemispheres, highest, of course, at the equator, where the points of high-water of both luminaries are, and gradually diminishing toward the poles, where, if the earth were

uniformly covered with water, there would be continual low water at those seasons.

b. About midsummer, in the northern hemisphere, the sun is vertical about 22 degrees north of the equator; and the new moon is, on the average, the same; but the full moon is on the average, as far on the south side of the equator. Therefore about midsummer the spring tides, at the new moon, will be highest in the northern hemisphere and those at full moon in the southern.

c. About mid-winter, the circumstances mentioned in the last article will be reversed.

It seems not necessary at present to examine more minutely the tide tables which are subjoined. The curves deduced from the indications of the figures have been projected corresponding to the first portion of the tables: those will assist the eye in following the figures; they stand in need of no explanation.

Valuable as are the observations of Captain Ross, it is to be hoped that we shall shortly be in possession of others more varied and valuable, and from which the possibility of inaccuracy will in a great measure be excluded.

The remarkable local currents dependent on the tides have not been touched upon. The Bore in the Hooghly has been very fully and minutely described in the Journal of the Asiatic Society, and could scarcely be brought in amongst our Bombay observations.

An excellent account of the Bore in the Gulf of Cambay, from the pen of Lieutenant R. Ethersey, of the Indian Navy, is to be found in the Transactions of the London Geographical Society. It is given below entire as a note, as not perhaps very familiar to most Bombay readers, many of whom have, from time to time, the opportunity of observing the currents described.

The Gulf of Cambay lies between 21 deg. 5 m. and 22 deg. 17 m. north latitude, and 72 deg. 19 m. and 72 deg. 51 m. east longitude; it is seventy-two miles long, and varies considerably in breadth. At the entrance between Vaux's Tomb and Gopnat'h Point it measures thirty-two miles across, which in a distance of ten leagues narrows, between B'aroch Bar and the island of Perim, to eight miles; it then opens out again to nineteen miles, between the entrance of the Dhadar river Bhaunagar on the Kathwar coast; this space, with the exception of three channels, is occupied by extensive shoals. The Gulf contracts again to ten miles between Gongwa and the western coast, on the same parallel with a remarkable spit of land which has formed within the last twenty years. Sandbanks extend from the shores on either side, which leave a channel between them towards the centre of the Gulf from three and a half to four and a half miles wide.

From the head of the Malacca banks* in lat. 21 deg. 10 m. N., to the parallel of Lohara, a point on the northern side of the entrance of the Narbada river, in 21 deg. 38 m. N., the gulf is, with the exception of the Bhagwa Sands,† clear of

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* Lieutenant Ethersey, in addition to his survey of the Gulf of Cambay from Diu Island, along the Kat'hiwar coast, around the head of the Gulf, and down its eastern shore as far as Surat, has lately examined, in detail, these extensive shoals, and thereby rendered an important service to hydrography.—Ed.

† So called from Bhagwa, a village on the north bank of a small stream called the Sena river, which takes its rise at Segwa and Schwan.

shoals, with irregular soundings from eight to thirty fathoms; but above this parallel it is filled with extensive shoals and sandbanks, having several deep channels between them, all of which are liable to shift, particularly during the rains. These channels all take a northerly direction, and the two principal ones unite in 22 deg. 7 m. N. and 72 deg. 36 m. E., a little below *G* on the plan, forming a channel three and a half miles wide, the greatest depth of water in this channel being six fathoms; it takes a north-easterly direction, runs close past Cambay Creek, from which it crosses to the south-eastward, and enters the Mahi river.

Another channel extends in a winding direction from the Sabarmati river close past the Amli Creek, from whence it keeps pretty close to the shore, and joins the main channel in about 22 deg. 9¼ m. N., below the Bore rocks; in both of these channels the flood-tide makes with a bore or wave, caused, wherever it is observed in this gulf, by a rapidly flowing tide forced through a narrow obstructed passage.

The rivers which empty themselves into this gulf are the Narbada, Dhadar, and Mahi,* from the eastward; the Sabarmati from the north; and the Bhadar, or Goma, from the westward: the three latter only can have any effect on the Bore, which in the fine season is trifling, as the discharge from them is then very inconsiderable; for the channel opposite Dehwan, on the north bank of the Mahi, is only 300 yards wide, a few inches deep, and the stream scarcely perceptible. Again, at the small pagoda marked *H* in the chart, in 22 deg. 24 m. N., on the east bank of the Sabarmati river, the channel at low-water is only 150 yards wide, with a mean depth of two feet, and the stream is too weak to be ascertained by the log.

The tides throughout the gulf are extremely rapid, and their rise and fall very large; the whole coast is low, overflowed for some distance inland at high spring tides, and intersected by numerous small creeks and inlets.

Its situation being such as to receive the full force of the tide-wave coming from the southward and from Diu Head, the south point of the peninsula of Gujerat, lying between the Gulfs of Cambay and Cutch, along the Kat'hiwar coast, together with its peculiar shape, will, I think, sufficiently account for the strong tides which are experienced here; for at Perim, twenty-six miles from the entrance of the gulf, the stream is forced through a space four times less than it occupied between Vaux's Tomb and Gopnat'h Point; and again, at *G*, below the Bore rocks, thirty-two miles farther north, it flows into a channel only one-ninth of its original width, being not quite half of its breadth at Perim; from which circumstances the velocity of the tide is not only considerably increased as it flows towards the northern parts of the gulf, but the water is also forced up to a higher level.

The eastern, or principal Bore, rises five miles to the west-south-westward of Cambay Creek, and is not perceptible in the neap tides without the previous spring tides have been very high, when it may be observed slightly through the quarter. It generally commences when the springs begin to lift; the wave increasing daily in height, as the tides gain strength; and it is at its greatest height about two days after new and full moon; it also varies with the night and day tide, because the higher the tide the greater is its velocity; and as the two tides differ from six to eight feet, and the flood of both runs the same length of time, the highest tide must have the greatest velocity, and hence the wave of the Bore will be highest with the greatest tide; the night tide both of new and full moon is the highest.

By a reference to the chart it will be seen that the channel between the Bore rocks and *A* on the eastern sandbank is quite clear, and free from shoals. It is four miles and a quarter wide, and the greatest depth six fathoms, where I

* *Vulgo*, M'hai.

found the velocity of the tide to be as follows, the direction being N.E. and S.W.:—

		K.	F.	Rise and Fall.
High Springs . . .	Flood . . .	6	0	33 feet.
	Ebb	7	2	
Ordinary Springs .	Flood . . .	4	4	25 „
	Ebb	6	2	
Neaps	Flood . . .	3	6	18 „
	Ebb	5	0	

From this point (*A*) the channel begins to narrow with a decreasing depth of water, until at *B*, seven miles higher up, it is only 550 yards wide, the greatest depth of water being seven feet. It is at this point that the tide first rises in a wave; when the flood makes, this may be seen running along both sides of the sandbanks, and it soon spreads across the channel, rapidly increasing in height; for by the time it passes *C*, a distance of not quite one mile and a half, it is nearly as high and has as great a velocity as it attains in any part of its course. From *C* it runs close to the high cliffs as far as *D*, spreading entirely across the channel, and rushing along with a loud roar. The small sandbank which commences at *D* turns it to the southward of east; and when abreast of Cambay Creek it is divided into two parts by another sandbank, the most considerable of the two taking a south-easterly direction towards the south bank of the Mahi river, and continues on this side as far as *E*, where it crosses to the north bank, near Dahwara, close to which it pursues its course to the village of Dehwan, where it is entirely broken and interrupted by a number of sandbanks, but proceeds several miles farther up, although with greatly diminished height and velocity.

The other part of the divided stream runs to the eastward and is soon exhausted, there being no free channel for it, and the banks are greatly elevated with gradual slopes, over which it flows very slowly.

The following data show the result of my observations on the ordinary spring tide on December 24, 1836, between the point *C* and Cambay Creek; the highest part of the wave being three feet and a half, its velocity nine knots, which was the utmost strength of the tide after the Bore had passed:—

H.	M.		K.	F.	H.	M.		K.	F.
0	5	after	3	6	0	30	after	6	0
0	10	„	5	7	0	40	„	7	0
0	20	„	4	4	0	50	„	6	2

Seven knots was the strongest.

The flood ran three hours: the rise and fall of the night tide was twenty-three feet; that of the day tide sixteen feet six inches; giving a difference of six feet six inches.

During the first hour the rise of tide was fifteen feet; in the second, six feet; and in the third, two feet.

In the first hour the water rose six feet during the first ten *minutes*, which will give some idea of the rapidity with which the tide rises.

January 7, 1837.—Very high spring tide, nearly up to the mark of the tide in the rains; between the point *C* and Camby Creek the highest part of the wave rose six feet, and its velocity was ten knots and a quarter, the strength being as follows:—

H.	M.		K.	F.	H.	M.		K.	F.
0	20	after	4	6	0	50	after	8	0
0	30	„	4	6	1	0	„	7	0
0	40	„	7	6	1	20	„	6	0

The flood tide ran three hours and two minutes. The rise and fall of the night

tide was thirty feet eleven inches, the day tide twenty-three feet; the difference being seven feet eleven inches.

	FT.	IN.
Rise of tide during the first hour,	18	4
Ditto „ second hour,	8	4
Ditto „ third hour,	3	6

The ebb tides run steadily, but do not acquire their greatest strength until more than half-tide has passed, when the high banks are uncovered, and the stream is confined to its proper channel.

Jan. 10, 1837.—Near the village of Dehwan, on the north bank of the Mahi, the highest part of the wave was seven feet, and its velocity ten knots. The rise and fall of the night tide was twenty-two feet; but by the mark of the tide on the shore, this was one foot lower than it had been a day or two before, which is too trifling to have diminished the effect of the Bore. I was not able to measure the rise of the tide here, having no convenient place to erect a scale; it ran only two hours fifty minutes; the greatest velocity of the flood was seven knots, and the ebb six knots two furlongs.

The Western Bore is so nearly similar to that just described, in almost every particular, except its direction and effect, that a very few additional remarks will be sufficient to point out the small difference between them; and even that would have been superfluous, had I not found a very great alteration in the banks and channel subsequently to my former report.

I found that from 700 to 1300 yards of the western shore had been washed away through the whole space from *I* to the east point, which is 1300 yards farther south than its former position; the bank all along, being a sandy cliff, continues still to fall with such frequency, from the action of the tide undermining it, that, in a short time, the coast will be quite straight from the Amli Creek to below that which is now the east point. Tons of this sandy bank are detached from the shore at one time, and these masses continue to fall into the water at different parts in such quick succession, that the report sounds at a distance like heavy artillery; the top of these cliffs, at two-thirds ebb, being from eighteen to twenty feet above the level of the water.

Again, the high sandbanks to the eastward of the Amli Creek, which were only partially covered by the neap tides, have been swept away; nothing but low sandbanks remaining in their place, and the channel leading to the Sabarmati river, which before took a N.N.E. direction from Amli Point direct for that river, now turns to N.N.W. at Amli Point, and runs along the shore close past Amli Creek, where it turns to the N.E., for the Sabarmati river.

The Bore on this side is now greatly diminished, the cause of which will, I think, be evident, when it is considered that formerly, instead of the whole force of the tide setting as at present to the N.E. past the Bore rocks, it took a N.N.W. direction, below the above rocks, right into the western channel, which is only now fed by a portion of the tide from the main stream.

At present the wave of the Bore on this side, as on the other, is not perceptible as formerly at the neap tide, but is confined to the springs, at which time it takes its rise at *F*, where the channel is only 150 yards wide, with three feet of water in it; its course is close to the shore as far as *B*, where it turns, and has to encounter a stream running at the rate of two miles an hour. I found its height here increase to four feet. After passing this, the channel widens a little, having low sandbanks, which the water spreads over, the wave decreasing to one and a half and two feet, and continuing at this height past the Amli Point, where it again runs close to the steep bank, and increases to three feet; it thus rushes along until it comes near to the Amli Creek, where it has to encounter a stream of two knots and a half; and, in consequence of the channel's turning, its whole force is directed to that part of the high sandbank marked *b*, where the wave was five feet; after passing this, it gradually diminishes to a few inches, for the banks are very low and the water so shallow that it can scarcely be called a channel, so that

the tide is not confined, but flows over the banks in all directions. It forms again, however, at the entrance of the Sabarmati, where the highest part was two feet; it continues its course (from this to one foot and a half) nearly to *H*, one mile past which it is lessened to a few inches.

Dec. 9, 1836.—Between *b* at Amli Creek and Amli Point, the highest part of the wave was five feet, its velocity eight knots and a half. The velocity of the flood tide after the Bore had passed was as follows:—

H.	M.		K.	F.	H.	M.		K.	F.
0	10	after	3	2	0	50	after	5	6
0	20	„	4	7	1	0	„	5	4
0	30	„	4	4	1	20	„	5	0
0	40	„	5	0					

Rise and fall of the night tide, twenty-eight feet; day tide, twenty-one feet two inches; the difference being six feet ten inches. The flood ran three hours and five minutes.

The velocity of the wave was ascertained by measuring a distance from two to three and a half miles in those parts where the waves ran close to the shore, and noting the time it took to go from one station to another by a good watch. The height of the wave off Cambay, Dehwan, and the Amli Creek, was ascertained by a pole, having feet marked on it, and in other places by estimation. The velocity of the flood was measured by the common log-line and glass—the patent log being of no use from the irregularity of the stream, as it would only have given a mean rate.

I have given the greatest heights of the wave during each spring tide; but this does not continue to be the same throughout its course, being affected by several circumstances which cause it to vary at different distances; for instance, at those points marked in the chart *a a a*, in the Mahi, and *b b*, on the western side, where the bank is steep, forming a concave, and the stream is strong, while the direction of the Bore is towards the steep bank, the wave at these points will be greatly increased in consequence of the force of the tide being directed to one point, as well as by the resistance of the stream. It is at these places that the wave frequently flows quite perpendicularly, having the appearance of a wall, when it curls and breaks with a thundering roar.

In those parts of its course, where the sandbanks are low on both sides, with a strong stream running in the centre, (which is the case in several parts on both sides,) the middle part of the wave will be retarded and increased in height by the resistance of the ebb; while towards each side, which is out of its influence, the wave proceeds with undiminished velocity, the whole forming in a crescent shape across the channel.

By the foregoing observations it will be seen, that the tide does not attain its full strength until forty or fifty minutes after it has made; it is until that time very irregular, coming with a sudden burst with great velocity, and then decreasing again slightly. The tide never attains the same velocity as the wave of the Bore; why this is the case I am not able to determine.

In *February* 1835, in order to try the effect of the Bore on a large-sized bunder boat, and at the same time to ascertain the strength of the stream after the wave had passed, at spring tide I anchored the boat half a mile to the northward of what was then the last cape on the western side of the gulf, and it proved a more dangerous experiment than I had anticipated; although I anchored in five fathoms, the boat grounded at low-water, and was left high and dry. A few hours afterwards, the noise of the Bore was heard, when every precaution was immediately taken for the safety of the boat. The night was still and calm, and its roar, as it approached, echoing among the neighbouring cliffs, was truly awful. It struck the boat, lifted her, and threw her violently round on her bilge; in which position she was forced before it, broadside on, for the space of five minutes, the grapnel being of no use, for it was carried faster than the boat. I fully

expected she would go to pieces, so violently was she shaken. However, no accident happened; for, on getting to a hollow in the sandbank, which was quickly filled, she righted, much to my satisfaction. About twenty minutes after this I hove the log, and found the stream running seven knots and a half, at which time the boat, I think, could not have been driving less then two knots and a half per hour, which would make the velocity of the stream ten knots. This I did not think too great; for although calm, the water frequently came over the boat's bows.

MAY 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I
	H. M.			H. M.			H. M.			H. M.		
1	1 ... A.M.	14	0	7. ... A.M.	3	5	1.15 P.M.	15	0	7.30 P.M.	7	0
2	1.30 ...	13	6	7.30 ...	4	0	2.0 ...	14	4	8.0 ...	7	6
3	2.0 ...	12	9	8.0 ...	4	6	2.30 ...	13	0	9.0 ...	8	0
4	3.0 ...	12	4	9.30 ...	5	3	3.30 ...	12	10	10.0 ...	8	6
5	4.0 ...	12	0	10.30 ...	6	0	4.30 ...	12	6	11.0 ...	8	7
6	5.0 ...	11	6	11.15 ...	6	6	5.30 ...	12	4	Midnight	8	0
7	6.0 ...	11	0				0.15 ...	6	3	6.30 ...	13	3
8	1.0 ...	7	6	7.0 ...	11	6	1.30 ...	6	0	8.0 ...	14	0
9	2.0 ...	6	9	8.30 ...	13	6	2.30 ...	6	0	9 0 ...	14	9
10	3.0 ...	5	0	9.30 ...	14	10	3.30 ...	5	4	10.0 ...	15	9
11	4.0 ...	2	8	10.30 ...	16	3	4 30 ...	5	2	11.0 ...	16	0
12	5.0 ...	1	6	11.30 ...	17	0	5.30 ...	5	2	11.30 ...	16	3
13	6.0 ...	1	0	Noon.	17	4	6.30 ...	5	3			
14	0.30 ...	15	10	7.0 ...	1	0	0.30 ...	17	4	6.30 ...	5	6
15	1.0 ...	15	6	7.30 ...	1	0	1.30 ...	17	3	7.30 ...	6	0
16	2.0 ...	14	6	8.30 ...	2	0	2.30 ...	16	3	8.30 ...	6	6
17	2.30 ...	14	0	9.0 ...	3	0	3.0 ...	15	3	9.30 ...	6	9
18	3.30 ...	13	0	9.30 ...	4	6	3.30 ...	14	6	10.0 ...	7	9
19	4.0 ...	12	0	10.30 ...	6	6	4.30 ...	13	9	11.0 ...	8	0
20	5.0 ...	11	6	11.30 ...	7	3	5.30 ...	13	6			
21	0.15 ...	8	3	7.0 ...	11	6	0.30 ...	7	3	7.30 ...	13	3
22	1.30 ...	6	9	8.0 ...	12	0	2.0 ...	7	0	8.30 ...	13	3
23	2.30 ...	6	0	9.0 ...	13	2	2.30 ...	7	3	9.0 ...	13	6
24	3.0 ...	5	0	9.30 ...	14	0	3.30 ...	7	0	9.30 ...	14	0
25	4.0 ...	4	3	10.30 ...	14	5	4.0 ...	7	3	10.30 ...	14	0
26	4.30 ...	3	9	11.0 ...	14	11	4.30 ...	7	4	11.0 ...	14	0
27	5.0 ...	3	6	11.30 ...	15	3	5.30 ...	7	3	11.45 ...	14	2
28	6.0 ...	3	3				0.30 ...	15	6	6.15 ...	7	6
29	0.30 ...	13	9	6.30 ...	3	4	1.0 ...	15	6	7.0 ...	7	9
30	1.0 ...	13	6	7.30 ...	4	0	2.0 ...	15	6	7.30 ...	7	10
31	2.0 ...	13	6	7.30 ...	4	3	2.30 ...	15	3	8.0 ...	8	6

JUNE 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	... A.M.	13	0	... A.M.	5	0	2.30 P.M.	15	0	8.30 P.M.	8	9
2	2.30 ...	12	9	8.30 ...	5	6	3.0 ...	14	9	9.0 ...	8	9
3	3.0 ...	12	6	9.0 ...	6	0	4.30 ...	14	3	10.30 ...	9	0
4	4.30 ...	11	6	10.30 ...	6	6	5.0 ...	13	9	11.30 ...	9	0
5	5.30 ...	11	6	11.30 ...	7	0	6.30 ...	14	0	0.30 A.M.	8	6
6	6.30 ...	12	0	0.30 P.M.	7	3	8.0 ...	14	3	0.30 ...	7	0
7	8.30 ...	13	6	1.0 ...	6	10	9.0 ...	14	6	2.0 ...	4	0
S 8	9.30 ...	14	9	2.15 ...	6	9	9.30 ...	14	9	2.15 ...	2	6
9	10.30 ...	16	0	3.30 ...	6	3	9.45 ...	15	6	3.45 ...	1	6
10	11.0 ...	17	0	4.30 ...	6	3	10.45 ...	15	6	5.0 ...	1	0
11	11.30 ...	17	3	5.30 ...	6	0	12.0 ...	15	3	6.0 ...	1	0
12	0.30 P.M.	17	3	6.0 ...	6	0	0.45 A.M.	15	3	6.30 ...	1	6
13	1.15 ...	17	0	6.30 ...	6	0	1.0 ...	15	0	7.0 ...	3	0
14	1.30 ...	16	9	7.0 ...	6	6	1.30 ...	14	6	7.30 ...	4	0
15	2.15 ...	16	6	9.0 ...	6	8	3.0 ...	13	11	9.0 ...	5	9
16	3.30 ...	15	6	9.45 ...	6	10	4.0 ...	12	6	10.0 ...	6	3
17	3.45 ...	14	3	10.30 ...	7	3	4.30 ...	12	0	10.30 ...	7	3
18	5.0 ...	13	3	11.0 ...	7	6	5.0 ...	11	9	11.30 ...	8	0
19	6.15 ...	13	0	11.45 ...	7	6	7.30 ...	12	3	0.30 P.M.	9	0
20	7.30 ...	12	8	1.0 A.M.	6	6	8.15 ...	12	9	1.30 ...	8	8
21	8.30 ...	12	9	2.0 ...	6	6	8.30 ...	13	3	2.30 ...	8	6
S 22	9.0 ...	13	0	3.0 ...	4	9	9.30 ...	14	3	3.30 ...	8	3
23	10.0 ...	13	3	4.0 ...	4	6	10.0 ...	14	9	4.0 ...	8	3
24	10.30 ...	13	3	4.30 ...	4	0	10.45 ...	15	3	5.0 ...	7	9
25	11.30 ...	13	6	5.30 ...	4	0	11.30 ...	15	6	5.45 ...	7	6
26	11.45 ...	13	8	5.45 ...	3	0	0.15 P.M.	15	9	6.0 ...	6	3
27	12.0 ...	13	6	6.15 ...	3	3	0.45 ...	15	9	6.45 ...	6	6
28	1.0 AM.	13	9	7.0 ...	3	3	1.30 ...	15	6	7.30 ...	6	9
29	1.30 ...	13	6	7.30 ...	3	9	2.0 ...	15	3	8.0 ...	7	0
30	2.30 ...	13	3	8.0 ...	4	6	3.0 ...	15	0	9.15 ...	7	3

JULY 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.0 A.M.	13	3	8.0 A.M.	4	6	3.0 P.M.	15	0	9.15 P.M.	7	3
2	4.0 ...	13	0	9.30 ...	5	6	4.0 ...	14	9	10.0 ...	6	6
3	4.0 ...	12	9	10.0 ...	6	8	4.0 ...	14	6	10.30 ...	6	9
4	5.0 ...	12	6	10.30 ...	7	0	5.0 ...	13	3	11.0 ...	7	0
5	5.45 ...	11	9	11.30 ...	8	0	6.30 ...	12	2	0.0 ...	0	0
6	0.15 ...	6	0	7.0 ...	12	3	0.15 ...	8	3	3.30 ...	14	3
7	1.0 ...	4	0	8.45 ...	14	9	1.30 ...	7	9	9.15 ...	14	6
8	2.0 ...	3	3	9.15 ...	15	0	3.0 ...	7	3	9.45 ...	14	8
9	3.30 ...	2	9	10.15 ...	16	0	4.0 ...	7	0	10.45 ...	15	0
10	3.45 ...	1	6	11.0 ...	17	0	5.0 ...	6	3	11.30 ...	15	3
11	5.15 ...	1	6	11.45 ...	17	3	5.30 ...	6	9	0.0 ...	0	0
12	0.15 ...	15	6	6.15 ...	2	3	1.0 ...	17	3	6.45 ...	6	0
13	1.0 ...	15	0	7.0 ...	3	3	1.30 ...	17	0	7.45 ...	5	10
14	1.45 ...	14	9	8.0 ...	3	10	2.0 ...	16	3	8.15 ...	6	0
15	2.30 ...	14	3	8.30 ...	5	6	2.30 ...	15	3	9.0 ...	6	6
16	3.0 ...	13	9	9.0 ...	7	0	3.0 ...	14	6	9.30 ...	7	0
17	3.30 ...	12	6	9.30 ...	7	9	4.0 ...	14	0	10.0 ...	7	0
18	5.0 ...	11	3	11.0 ...	8	9	5.30 ...	13	3	11.45 ...	6	10
19	6.0 ...	7	6	11.45 ...	9	3	6.30 ...	12	3	0.0 ...	0	0
20	0.30 ...	6	0	6.30 ...	12	6	0.30 ...	9	6	7.15 ...	12	0
21	1.0 ...	6	0	8.15 ...	13	3	1.15 ...	9	6	8.0 ...	12	3
22	2.30 ...	4	0	9.0 ...	13	6	3.0 ...	9	0	9.0 ...	12	6
23	3.30 ...	4	10	9.30 ...	14	3	3.15 ...	8	0	10.0 ...	12	8
24	3.45 ...	4	6	10.30 ...	14	9	5.30 ...	7	9	10.30 ...	13	0
25	5.30 ...	4	3	11.0 ...	15	3	5.0 ...	7	0	11.30 ...	13	9
26	5.30 ...	3	0	11.45 ...	15	9	5.45 ...	6	6	0.0 ...	0	0
27	0.15 ...	14	3	6.0 ...	3	0	0.30 ...	16	3	7.0 ...	6	0
28	1.0 ...	14	6	7.0 ...	3	3	1.0 ...	16	3	7.30 ...	5	6
29	1.30 ...	14	3	7.30 ...	3	6	1.30 ...	16	0	8.0 ...	5	3
30	2.0 ...	14	0	8.0 ...	4	3	2.15 ...	15	9	8.30 ...	5	6
31	2.30 ...	13	9	8.30 ...	5	0	2.45 ...	15	0	9.45 ...	5	3

AUGUST 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.0 A.M.	13	5	10.0 A.M.	6	6	4.0 P.M.	14	6	11.0 P.M.	6	0
2	4.30 ...	13	0	11.15 ...	7	6	5.0 ...	13	6	11.30 ...	6	3
3	5.45 ...	12	10	11.30 ...	8	6	6.0 ...	12	9	0.0 ...	0	0
4	0.15 ...	6	6	6.0 ...	13	6	0.15 ...	9	0	7.30 ...	12	9
5	1.30 ...	6	3	8.0 ...	14	0	2.0 ...	8	0	8.30 ...	13	3
S 6	2.45 ...	4	0	9.0 ...	15	0	4.15 ...	6	3	9.45 ...	13	6
7	3.45 ...	3	9	10.30 ...	15	9	4.15 ...	5	9	10.30 ...	14	0
8	4.45 ...	2	0	11.0 ...	16	3	5.30 ...	5	5	11.30 ...	14	3
9	6.0 ...	2	0	0.0 ...	0	0	0.15 ...	16	6	5.45 ...	5	2
10	0.15 ...	14	6	6.15 ...	2	0	1.0 ...	16	6	5.45 ...	5	0
11	1.15 ...	14	8	6.30 ...	3	0	1.30 ...	16	0	7.15 ...	5	3
12	2.0 ...	14	8	7.30 ...	4	3	2.0 ...	15	9	8.0 ...	5	0
13	2.30 ...	14	3	8.30 ...	5	0	2.30 ...	14	9	9.15 ...	5	3
14	3.30 ...	13	3	9.45 ...	6	6	3.45 ...	12	3	10.0 ...	6	0
15	4.0 ...	13	0	10.0 ...	7	0	4.15 ...	12	6	10.15 ...	6	0
16	4.30 ...	12	0	10.30 ...	8	0	4.45 ...	11	9	10.45 ...	6	6
17	5.0 ...	11	9	11.0 ...	9	0	5.15 ...	11	8	11.30 ...	7	3
18	6.0 ...	12	0	11.45 ...	9	0	7.0 ...	11	3	0.0 ...	0	0
19	1.0 ...	7	0	8.0 ...	12	6	2.0 ...	9	3	7.30 ...	11	0
S 20	2.0 ...	7	3	9.0 ...	12	9	3.0 ...	8	6	9.0 ...	11	3
21	3.0 ...	5	6	9.30 ...	13	6	3.30 ...	7	6	9.30 ...	11	8
22	3.45 ...	4	9	10.0 ...	14	6	5.0 ...	6	6	11.0 ...	12	3
23	5.0 ...	4	0	11.0 ...	15	0	5.15 ...	5	10	11.15 ...	13	6
24	5.15 ...	3	0	11.30 ...	15	9	5.30 ...	5	0	11.30 ...	14	8
25	5.45 ...	3	3	0.0 ...	0	0	0.15 ...	16	0	6.30 ...	4	0
26	0.30 ...	15	6	6.30 ...	3	6	0.30 ...	16	9	6.30 ...	3	3
27	1.0 ...	15	9	6.45 ...	3	10	1.15 ...	16	9	7.0 ...	4	0
28	1.45 ...	16	3	7.30 ...	4	10	2.0 ...	16	3	8.0 ...	4	6
29	2.0 ...	16	0	8.0 ...	5	9	2.30 ...	16	0	8.30 ...	5	0
30	3.0 ...	15	3	8.45 ...	7	0	3.0 ...	15	0	9.0 ...	5	0
31	3.15 ...	14	9	9.45 ...	8	9	4.30 ...	13	6	10.45 ...	5	0

SEPTEMBER 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.45 A.M.	13	3	11.30 A.M.	9	0	6.30 P.M.	12	6	11.30 P.M.	5	10
2	7.0 ...	13	2	0.0 ...	0	0	0.15 ...	9	3	7.0 ...	11	6
S 3	1.30 ...	6	0	8.0 ...	13	6	2.0 ...	8	0	8.45 ...	12	6
4	2.30 ...	5	0	9.15 ...	14	9	2.30 ...	7	0	9.45 ...	13	3
5	3.0 ...	4	0	10.0 ...	15	6	4.0 ...	6	0	10.0 ...	14	6
6	4.0 ...	3	6	10.0 ...	16	3	5.0 ...	5	0	10.45 ...	15	6
7	5.0 ...	3	0	11.0 ...	16	6	5.45 ...	5	0	11.30 ...	15	9
8	6.0 ...	3	9	0.0 ...	0	0	0.15 ...	16	6	6.15 ...	4	6
9	0.15 ...	16	0	6.0 ...	4	6	0.45 ...	16	0	7.0 ...	4	6
10	1.0 ...	16	2	7.0 ...	5	0	1.0 ...	15	3	7.30 ...	4	3
11	1.30 ...	15	6	7.30 ...	5	6	1.30 ...	14	6	8.0 ...	4	6
12	2.0 ...	14	9	8.15 ...	6	6	2.0 ...	14	0	8.30 ...	5	0
13	2.30 ...	14	0	8.30 ...	7	6	2.45 ...	13	0	9.0 ...	6	0
14	3.0 ...	13	0	9.0 ...	8	6	3.15 ...	12	3	9.30 ...	6	6
15	3.45 ...	12	0	10.0 ...	9	0	4.30 ...	11	3	10.0 ...	6	9
16	5.30 ...	11	9	10.15 ...	9	6	6.0 ...	10	6	11.45 ...	6	2
17	7.0 ...	12	0	0.0 ...	0	0	0.30 ...	9	3	7.0 ...	10	3
18	1.0 ...	6	0	8.0 ...	12	9	2.0 ...	8	6	8.0 ...	11	3
S 19	2.0 ...	5	0	9.0 ...	13	9	3.0 ...	7	3	9.0 ...	12	0
20	3.0 ...	4	6	9.30 ...	14	9	3.30 ...	6	6	9.30 ...	13	6
21	3.30 ...	4	0	9.45 ...	15	6	4.30 ...	5	0	10.15 ...	14	9
22	4.45 ...	3	0	10.45 ...	16	0	5.30 ...	4	0	11.30 ...	15	6
23	5.45 ...	3	0	11.30 ...	16	9	6.0 ...	3	0	0.0 ...	0	0
24	0.15 ...	16	0	6.0 ...	3	6	0.15 ...	16	9	6.30 ...	1	9
25	0.45 ...	16	3	6.30 ...	4	3	1.0 ...	16	8	7.0 ...	1	3
26	1.0 ...	16	9	6.45 ...	5	0	1.15 ...	15	9	8.0 ...	3	3
27	1.30 ...	16	2	8.15 ...	6	3	2.0 ...	14	9	8.30 ...	3	6
28	2.30 ...	15	0	9.0 ...	7	9	3.0 ...	13	9	10.0 ...	4	0
29	4.0 ...	14	0	10.30 ...	8	9	4.0 ...	12	3	11.0 ...	5	0
30	4.30 ...	13	0	11.30 ...	9	0	5.0 ...	11	3	0.0 ...	0	0

OCTOBER 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.15 A.M.	6	0	6.0 A.M.	12	6	1.0 P.M.	8	0	6.30 P.M.	11	0
2	1.45 ...	6	6	8.0 ...	13	3	2.0 ...	6	6	8.30 ...	12	0
S 3	2.30 ...	6	0	8.30 ...	14	0	3.30 ...	6	0	9.30 ...	13	6
4	3.0 ...	5	0	9.45 ...	14	8	4.0 ...	4	6	10.0 ...	14	0
5	4.15 ...	4	0	10.30 ...	15	0	5.0 ...	4	0	10.45 ...	14	6
6	5 30 ...	4	3	11.0 ...	15	2	5.30 ...	3	9	11.30 ...	15	0
7	5.30 ...	4	6	11.45 ...	15	3	5.45 ...	3	6			
8	0.15 ...	15	6	6.0 ...	5	0	0.15 ...	15	0	6.30 ...	3	2
9	0.30 ...	15	3	6.45 ...	5	6	0.45 ...	14	8	7.30 ...	3	10
10	1.0 ...	15	0	7.15 ...	6	6	1.45 ...	13	9	7.30 ...	5	0
11	2.0 ...	14	6	7.45 ...	7	6	2.15 ...	13	6	8.0 ...	6	0
12	2.30 ...	14	3	8.45 ...	8	0	2.30 ...	13	0	8.45 ...	6	0
13	2.45 ...	14	0	9.0 ...	8	9	2.45 ...	12	3	9.0 ...	6	6
14	3.0 ...	13	2	9.15 ...	9	6	3.30 ...	11	6	9.30 ...	7	0
15	4.0 ...	12	3	10.0 ...	9	6	4.15 ...	10	8	10.30 ...	7	6
16	5.30 ...	12	6	11.30 ...	8	9	6.0 ...	11	3	11.30 ...	8	0
17	6.30 ...	12	6	0.0 ...	0	0	0.1 ...	7	6	7.30 ...	11	0
18	2.0 ...	6	6	8.0 ...	13	3	2.30 ...	6	6	8.30 ...	12	6
S 19	2.30 ...	5	6	8.30 ...	14	6	3.30 ...	5	6	9.15 ...	14	0
20	3.45 ...	4	0	10.0 ...	15	3	4.0 ...	3	3	10.15 ...	15	3
21	4.15 ...	4	0	10.30 ...	15	9	5.0 ...	2	6	10.45 ...	16	6
22	5.15 ...	4	0	11.0 ...	16	3	5.30 ...	1	4	11.15 ...	17	0
23	5.45 ...	4	3	11.30 ...	16	3	6.0 ...	1	0			
24	0.15 ...	17	3	6.30 ...	4	6	0.15 ...	15	9	7.0 ...	1	0
25	1.0 ...	17	3	7.0 ...	6	0	1.15 ...	14	9	7.30 ...	1	0
26	1.30 ...	16	8	8.0 ...	6	3	1.45 ...	13	9	8.0 ...	2	6
27	2.0 ...	15	3	8.15 ...	7	0	2.30 ...	12	6	9.0 ...	3	0
28	3.30 ...	14	6	9.30 ...	8	0	4.0 ...	11	6	10.30 ...	5	0
29	5.0 ...	13	0	11.30 ...	7	9	5.30 ...	10	9	11.45 ...	5	0
30	6.30 ...	12	6	0.0 ...	0	0	0.30 ...	7	0	6.0 ...	11	3
31	1.0 ...	6	2	7.0 ...	13	0	2.0 ...	6	0	8.0 ...	12	6

NOVEMBER 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.0 A.M.	6	9	8.30 A.M.	13	9	2.30 P.M.	5	6	9.30 P.M.	13	6
S 2	3.0 ...	6	0	9.0 ...	14	0	3.0 ...	4	6	9.45 ...	14	6
3	3.30 ...	6	0	10.0 ...	14	3	4.0 ...	4	3	10.0 ...	14	9
4	4.15 ...	5	6	10.15 ...	14	6	4.30 ...	4	0	11.0 ...	15	0
5	5.0 ...	6	0	11.30 ...	14	3	5.15 ...	3	0	11.30 ...	15	3
6	5.30 ...	6	3	11.45 ...	14	3	5.45 ...	2	9	0.0 ...	0	0
7	0.15 ...	15	6	6.30 ...	6	5	0.15 ...	13	9	5.30 ...	3	0
8	1.0 ...	15	6	6.30 ...	7	0	1.15 ...	13	6	7.0 ...	3	6
9	1.30 ...	15	0	7.45 ...	7	3	1.30 ...	12	9	7.0 ...	3	9
10	1.45 ...	14	6	8.0 ...	7	6	2.0 ...	12	0	7.30 ...	4	0
11	2.30 ...	14	0	9.0 ...	7	6	2.30 ...	11	6	9.0 ...	5	0
12	3.0 ...	13	6	9.15 ...	7	9	3.0 ...	11	0	9.30 ...	6	0
13	3.30 ...	13	0	9.30 ...	8	3	3.30 ...	10	6	10.30 ...	6	6
14	4.30 ...	12	6	10.30 ...	8	6	4.30 ...	10	3	11.45 ...	7	0
15	6.0 ...	13	2	11.45 ...	7	4	6.30 ...	11	9	0.0 ...	0	0
16	1.0 ...	7	9	7.0 ...	13	9	1.30 ...	6	0	8.30 ...	13	0
S 17	2.0 ...	7	0	8.30 ...	14	6	2.30 ...	4	6	9.0 ...	14	9
18	3.0 ...	6	6	9.30 ...	15	0	3.30 ...	3	0	10.0 ...	16	0
19	4.30 ...	5	6	10.15 ...	15	6	4.0 ...	1	10	10.45 ...	17	0
20	4.30 ...	4	9	11.0 ...	15	9	5.0 ...	1	0	11.30 ...	17	6
21	5.0 ...	5	3	11.30 ...	15	10	5.30 ...	1	0	0.0 ...	0	0
22	0.30 ...	17	6	6.30 ...	6	0	0.30 ...	15	9	6.30 ...	1	0
23	1.0 ...	17	9	7.0 ...	6	6	1.0 ...	15	0	7.30 ...	1	0
24	1.30 ...	17	0	8.0 ...	6	3	1.45 ...	14	0	8.30 ...	3	0
25	2.30 ...	16	0	9.0 ...	6	6	2.45 ...	13	0	9.0 ...	6	6
26	3.0 ...	15	0	9.30 ...	7	0	3.30 ...	12	0	10.30 ...	6	9
27	3.45 ...	14	3	11.0 ...	7	3	5.30 ...	11	6	11.45 ...	6	9
28	6.0 ...	13	9	0.0 ...	0	0	0.30 ...	7	0	5.30 ...	10	6
29	0.30 ...	6	6	6.30 ...	12	0	1.0 ...	6	6	7.30 ...	12	6
30	1.0 ...	6	0	7.0 ...	13	0	2.0 ...	5	0	8.0 ...	13	3

DECEMBER 1835.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.30 A.M.	7	0	8.15 A.M.	13	0	3.30 P.M.	4	9	9.0 P.M.	14	0
2	3.0 ...	7	6	9.0 ...	13	6	4.0 ...	4	6	10.0 ...	15	3
3	4.0 ...	8	0	10.0 ...	13	8	4.15 ...	4	3	10.45 ...	15	6
4	4.45 ...	7	9	11.0 ...	13	6	5.0 ...	3	6	11.30 ...	15	9
5	5.30 ...	7	6	11.30 ...	13	6	5.45 ...	3	10	11.45 ...	16	0
6	6.0 ...	7	6	0.0 ...	0	0	0.15 ...	13	6	6.15 ...	3	10
7	0.30 ...	16	0	6 30 ...	7	9	0.45 ...	13	8	6.45 ...	3	6
8	1.0 ...	15	10	7.0 ...	8	0	1.0 ...	13	6	7.0 ...	4	0
9	1.15 ...	15	6	7.30 ...	8	0	1.15 ...	13	3	7.30 ...	4	6
10	1.30 ...	15	0	8.30 ...	8	0	1.45 ...	12	9	8.30 ...	5	6
11	2.30 ...	14	6	9.0 ...	8	0	2.30 ...	12	6	9.0 ...	6	0
12	3.0 ...	14	3	9.15 ...	8	3	3.30 ...	12	0	9.45 ...	6	6
13	3.30 ...	14	0	9.45 ...	7	10	4.0 ...	12	0	10.0 ...	7	0
14	5.0 ...	13	9	11.0 ...	7	3	5.45 ...	12	0	11.45 ...	7	6
15	6.30 ...	14	2	0.0 ...	0	0	0.30 ...	5	6	7.15 ...	13	4
16	1.15 ...	7	3	7.30 ...	14	3	1.30 ...	4	3	8.30 ...	14	9
S 17	2.30 ...	7	0	8.30 ...	14	6	2.45 ...	3	0	9.45 ...	16	4
18	3.45 ...	7	3	9.45 ...	14	9	4.0 ...	2	0	10.15 ...	17	0
19	4.15 ...	7	3	10.15 ...	15	0	4.45 ...	1	3	11.0 ...	17	6
20	4.45 ...	6	6	11.30 ...	15	6	5.0 ...	1	0	11.45 ...	18	3
21	5.0 ...	6	0	11.45 ...	15	6	6.0 ...	1	0	0.0 ...	0	0
22	0.30 ...	18	3	6.0 ...	5	6	0.45 ...	15	3	7.0 ...	1	0
23	1.0 ...	17	6	7.45 ...	6	0	1.30 ...	14	9	8.0 ...	3	0
24	2.0 ...	17	3	8.30 ...	6	0	2.45 ...	14	6	9.0 ...	5	3
25	3.0 ...	15	6	9.0 ...	6	0	3.15 ...	12	8	10.0 ...	5	9
26	3.45 ...	14	3	10.30 ...	6	3	3.45 ...	12	0	11.0 ...	6	6
27	4.0 ...	13	9	11.30 ...	6	0	5.30 ...	11	6	11.30 ...	6	6
28	5.30 ...	13	6	0.0 ...	0	0	0.15 ...	6	4	6.0 ...	11	9
29	0.30 ...	9	9	6.30 ...	12	9	0.45 ...	6	0	7.30 ...	12	3
30	1.30 ...	8	9	7.0 ...	12	3	2.0 ...	5	6	8.0 ...	13	0
S 31	2.30 ...	9	0	8.30 ...	12	3	2.45 ...	4	9	9.30 ...	13	9

JANUARY 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.15 A.M.	8	6	9.30 A.M.	12	3	3.30 P.M.	4	3	10.0 P.M.	14	6
2	4.0 ...	8	0	10.0 ...	12	3	4.30 ...	3	6	11.0 ...	15	0
3	4.45 ...	7	6	10.30 ...	12	6	5.0 ...	3	0	11.30 ...	15	3
4	6.0 ...	7	0	11.30 ...	12	9	5.30 ...	2	9	0.0 ...	0	0
5	0.30 ...	15	6	6.30 ...	6	6	0.30 ...	13	3	6.0 ...	3	3
6	0.45 ...	16	0	6.30 ...	6	3	0.45 ...	13	3	6.45 ...	4	0
7	1.15 ...	15	6	7.45 ...	6	0	2.0 ...	13	3	8.0 ...	4	8
8	2.0 ...	15	9	8.15 ...	6	0	2.15 ...	13	0	8.30 ...	5	3
9	2.30 ...	15	6	8.30 ...	5	6	2.30 ...	12	9	9.0 ...	5	6
10	3.0 ...	15	3	9.0 ...	6	0	3.0 ...	12	8	9.30 ...	6	0
11	3.30 ...	15	0	10.0 ...	5	6	4.15 ...	12	8	10.30 ...	6	3
12	4.30 ...	14	3	11.0 ...	5	0	5.0 ...	12	0	11.0 ...	6	6
13	5.30 ...	14	0	11.30 ...	4	3	6.30 ...	13	0	0.0 ...	0	0
S 14	1.0 ...	8	0	6.30 ...	12	0	1.0 ...	3	6	7.0 ...	13	6
15	1.15 ...	7	9	7.0 ...	12	6	2.45 ...	2	9	9.0 ...	14	9
16	3.0 ...	7	0	9.30 ...	13	0	3.30 ...	2	9	10.0 ...	16	0
17	4.0 ...	6	6	10.0 ...	13	3	5.0 ...	1	9	10.30 ...	17	0
18	5.30 ...	5	9	10.30 ...	14	6	5.45 ...	1	6	11.30 ...	17	6
19	6.0 ...	5	6	11.30 ...	15	3	6.30 ...	1	0	0.0 ...	0	0
20	0.30 ...	17	9	6.45 ...	5	0	0.30 ...	15	6	7.30 ...	2	0
21	1.30 ...	17	6	7.30 ...	4	9	1.30 ...	15	3	7.45 ...	3	9
22	2.0 ...	17	3	7.45 ...	4	9	2.0 ...	14	9	8.0 ...	4	6
23	2.30 ...	16	6	8.0 ...	5	4	2.45 ...	14	2	9.0 ...	6	0
24	2.45 ...	15	9	9.30 ...	5	6	4.0 ...	13	3	10.30 ...	7	0
25	4.30 ...	14	6	10.30 ...	6	0	4.30 ...	12	3	11.0 ...	8	9
26	5.0 ...	13	9	11.0 ...	6	6	5.30 ...	12	0	11.30 ...	9	0
27	5.30 ...	13	0	12.0 ...	6	6	6.0 ...	12	3	0.0 ...	0	0
28	0.30 ...	9	3	6.30 ...	11	6	1.0 ...	6	3	8.0 ...	12	6
29	2.0 ...	9	0	8.0 ...	11	0	2.0 ...	5	6	9.0 ...	13	3
S 30	2.30 ...	8	9	9.0 ...	11	3	3.30 ...	5	0	9.45 ...	14	3
31	4.0 ...	8	4	10.0 ...	11	9	4.15 ...	4	6	10.30 ...	15	0

FEBRUARY 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.30 A.M.	7	10	10.30 A.M.	12	6	4.30 P.M.	3	9	11.30 P.M.	15	0
2	5.30 ...	6	9	11.15 ...	13	3	5.45 ...	3	3	11.45 ...	16	0
3	5.45 ...	6	0	11.45 ...	13	10	6.0 ...	3	2	0.0 ...	0	0
4	0.30 ...	16	2	6.30 ...	5	6	1.0 ...	14	3	6.45 ...	2	0
5	1.30 ...	16	3	7.0 ...	5	4	1.30 ...	15	0	7.45 ...	2	6
6	1.45 ...	16	6	7.45 ...	4	9	2.0 ...	15	0	8.30 ...	4	6
7	2.30 ...	16	6	8.30 ...	4	6	2.30 ...	14	10	9.0 ...	5	0
8	2.30 ...	16	6	9.0 ...	4	6	2.45 ...	14	5	9.15 ...	6	3
9	3.0 ...	16	0	9.30 ...	4	8	3.30 ...	14	0	9.45 ...	7	3
10	3.30 ...	15	3	10.0 ...	5	0	4.30 ...	13	6	11.0 ...	8	6
11	4.30 ...	14	9	11.0 ...	5	3	6.30 ...	13	6	0.0 ...	0	0
12	0.30 ...	8	0	7.0 ...	11	6	0.30 ...	5	3	7.45 ...	14	0
13	1.0 ...	8	6	8.0 ...	12	3	1.30 ...	4	3	9.0 ...	14	9
14	3.15 ...	7	9	9.30 ...	13	0	3.30 ...	3	0	10.0 ...	16	0
S 15	4.0 ...	7	6	10.0 ...	14	0	4.0 ...	2	3	10.45 ...	16	9
16	4.30 ...	5	6	11.0 ...	15	0	5.0 ...	2	0	11.0 ...	17	3
17	5.0 ...	4	3	11.15 ...	15	3	6.30 ...	1	9	0.0 ...	0	0
18	0.30 ...	17	3	6.45 ...	4	0	0.30 ...	15	3	7.0 ...	1	3
19	1.0 ...	17	3	7.15 ...	3	3	1.0 ...	15	3	7.30 ...	1	6
20	1.30 ...	17	0	7.30 ...	3	6	2.0 ...	15	0	8.0 ...	3	3
21	2.0 ...	16	6	8.30 ...	4	0	2.15 ...	14	6	8.30 ...	4	6
22	2.30 ...	15	9	8.30 ...	4	6	2.30 ...	13	6	9.0 ...	7	0
23	3.0 ...	14	3	9.30 ...	5	0	3.30 ...	12	6	10.0 ...	6	6
24	3.45 ...	12	9	9.45 ...	5	6	4.30 ...	11	9	11.0 ...	7	9
25	4.30 ...	12	0	11.0 ...	6	7	5.0 ...	11	6	11.30 ...	8	3
26	5.0 ...	11	3	11.30 ...	7	0	7.0 ...	12	0	0.0 ...	0	0
27	0.30 ...	8	6	7.15 ...	11	0	1.0 ...	5	9	8.15 ...	12	6
28	2.0 ...	8	0	8.0 ...	11	3	2.0 ...	6	0	9.0 ...	13	9
S 29	3.0 ...	7	9	9.0 ...	11	9	3.0 ...	5	6	9.30 ...	14	9

MARCH 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.30 A.M.	7	6	10.0 A.M.	12	9	4.0 P.M.	4	3	10.45 P.M.	15	6
2	4.45 ...	6	6	11.0 ...	13	9	5.0 ...	4	0	11.30 ...	15	9
3	5.45 ...	5	6	11.30 ...	14	9	5.45 ...	3	9	0.0 ...	0	0
4	0.15 ...	16	3	6.0 ...	5	0	0.15 ...	15	6	6.30 ...	4	0
5	1.0 ...	17	0	6.30 ...	4	0	1.0 ...	16	0	7.30 ...	4	6
6	1.30 ...	17	0	7.30 ...	3	9	1.45 ...	16	6	8.0 ...	5	0
7	2.0 ...	17	0	7.45 ...	3	3	2.15 ...	16	6	8.15 ...	6	6
8	2.45 ...	16	3	8.30 ...	3	0	3.0 ...	15	9	9.30 ...	7	0
9	3.30 ...	15	9	9.30 ...	4	0	3.30 ...	14	9	9.45 ...	7	9
10	3.45 ...	15	0	10.0 ...	4	6	4.15 ...	14	9	10.45 ...	8	6
11	4.15 ...	13	9	11.0 ...	5	6	5.30 ...	13	3	11.30 ...	9	0
12	5.30 ...	12	6	11.30 ...	5	9	7.30 ...	12	8	0.0 ...	0	0
13	1.30 ...	9	0	7.45 ...	12	3	2.45 ...	5	0	9.0 ...	14	9
S 14	3.0 ...	8	9	9.0 ...	13	0	3.45 ...	4	6	9.45 ...	15	9
15	4.0 ...	6	9	10.0 ...	14	3	4.45 ...	3	3	10.45 ...	16	3
16	4.30 ...	5	3	10.45 ...	15	0	5.0 ...	3	3	11.30 ...	17	0
17	5.30 ...	4	0	11.45 ...	16	0	5.45 ...	3	3	0.0 ...	0	0
18	0.30 ...	17	3	6.30 ...	3	6	0.30 ...	16	0	6.0 ...	3	9
19	1.0 ...	16	9	7.0 ...	3	0	1.30 ...	15	9	7.30 ...	3	6
20	2.0 ...	15	9	7.30 ...	3	6	2.15 ...	15	9	7.30 ...	5	6
21	2.15 ...	15	9	7.30 ...	4	0	2.30 ...	15	3	8.0 ...	6	6
22	2.30 ...	15	3	8.0 ...	4	6	3.0 ...	14	9	9.0 ...	7	0
23	3.0 ...	14	9	9.0 ...	5	3	3.30 ...	14	0	9.30 ...	7	9
24	3.30 ...	13	9	9.15 ...	6	0	3.45 ...	12	9	10.0 ...	8	6
25	4.0 ...	12	9	9.45 ...	6	6	5.0 ...	12	2	10.15 ...	8	9
26	5.30 ...	11	9	11.0 ...	7	0	5.30 ...	11	9	11.45 ...	9	6
27	6.0 ...	11	9	11.45 ...	7	3	8.0 ...	12	3	0.0 ...	0	0
28	1.0 ...	8	9	8.30 ...	11	6	1.30 ...	6	4	9.0 ...	13	6
S 29	1.45 ...	7	0	9.0 ...	11	6	2.45 ...	5	6	9.30 ...	14	3
30	3.30 ...	6	0	9.30 ...	12	6	3.30 ...	4	9	10.30 ...	15	0
31	4.15 ...	5	3	10.30 ...	14	0	4.45 ...	4	0	11.30 ...	16	0

APRIL 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.0 A.M.	3	3	11.30 A.M.	15	3	4.45 P.M.	3	9	0.0 P.M.	0	0
2	0.15 ...	16	6	5.30 ...	3	0	0.15 ...	16	3	6.0 ...	4	0
3	0.45 ...	16	9	6.30 ...	2	0	0.45 ...	17	0	6.30 ...	4	3
4	1.0 ...	17	0	6.45 ...	1	6	1.0 ...	17	0	7.30 ...	5	0
5	1.30 ...	16	8	7.45 ...	2	0	1.30 ...	16	9	7.45 ...	6	3
6	2.0 ...	16	3	8.15 ...	2	6	2.30 ...	16	3	8.45 ...	8	0
7	3.30 ...	15	9	9.0 ...	3	6	3.30 ...	15	0	10.0 ...	8	3
8	4.0 ...	13	9	10.0 ...	4	6	4.30 ...	13	9	10.45 ...	9	0
9	5.0 ...	12	6	11.0 ...	5	9	6.0 ...	13	6	11.45 ...	8	9
10	6.30 ...	11	6	0.0 ...	0	0	0.30 ...	6	3	7.0 ...	13	6
11	1.0 ...	7	9	7.30 ...	12	0	1.30 ...	5	6	8.30 ...	14	0
S 12	2.30 ...	7	0	9.0 ...	13	3	3.0 ...	5	3	9.0 ...	15	0
13	3.30 ...	5	8	10.0 ...	14	6	4.0 ...	5	0	10.45 ...	16	0
14	4.0 ...	3	6	11.0 ...	15	6	5.0 ...	5	0	11.0 ...	16	0
15	5.30 ...	3	3	11.30 ...	15	9	5.45 ...	5	3	11.45 ...	16	0
16	6.0 ...	3	0	0.0 ...	0	0	0.15 ...	16	0	5.30 ...	5	9
17	0.15 ...	15	6	6.0 ...	3	0	0.30 ...	16	0	6.0 ...	6	0
18	0.30 ...	15	0	6.30 ...	3	3	1.0 ...	15	9	7.0 ...	6	3
19	1.0 ...	14	9	7.30 ...	4	0	1.30 ...	15	6	8.0 ...	7	0
20	2.0 ...	14	0	8.0 ...	4	6	2.15 ...	15	3	8.15 ...	7	9
21	2.30 ...	13	6	8.30 ...	5	0	2.30 ...	14	4	8.45 ...	8	0
22	2.45 ...	12	10	8.45 ...	5	6	3.15 ...	13	6	9.30 ...	8	6
23	3.30 ...	12	6	9.30 ...	6	6	3.30 ...	13	0	9.45 ...	9	0
24	3.45 ...	11	6	10.0 ...	7	0	4.0 ...	12	6	10.30 ...	9	3
25	5.0 ...	11	3	11.0 ...	7	6	7.30 ...	12	6	11.45 ...	8	0
26	7.30 ...	11	0	0.0 ...	0	0	1.30 ...	6	0	8.0 ...	13	3
27	2.0 ...	7	6	8.15 ...	12	0	2.0 ...	5	6	8.45 ...	14	0
S 28	2.45 ...	6	9	9.0 ...	13	6	2.45 ...	5	6	9.30 ...	15	0
29	3.30 ...	4	6	10.0 ...	15	0	4.0 ...	5	9	10.0 ...	15	9
30	4.30 ...	3	6	10.45 ...	16	3	4.45 ...	5	6	11.0 ...	16	0

MAY 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.0 A.M.	2	0	11.30 A.M.	17	0	5.30 P.M.	5	6	11.30 P.M.	16	6
2	6.0 ...	1	0	0.0 ...	0	0	0.15 ...	17	6	5.45 ...	5	0
3	0.45 ...	16	9	7.0 ...	1	0	1.0 ...	17	9	6.30 ...	6	0
4	1.30 ...	16	9	7.0 ...	1	0	1.45 ...	17	6	7.0 ...	6	3
5	2.15 ...	16	0	7.30 ...	1	3	2.15 ...	16	3	8.45 ...	7	6
6	2.45 ...	14	6	9.0 ...	3	3	3.0 ...	15	3	9.30 ...	8	0
7	3.30 ...	13	0	9.30 ...	4	6	4.0 ...	14	0	10.0 ...	8	6
8	4.30 ...	12	3	11.0 ...	5	6	5.0 ...	13	3	10.45 ...	8	9
9	5.30 ...	11	6	11.30 ...	6	0	6.30 ...	13	0	0.0 ...	0	0
10	0.30 ...	8	9	6.30 ...	11	9	1.0 ...	6	3	8.0 ...	13	3
11	2.0 ...	4	6	8.30 ...	12	6	2.30 ...	6	0	9.0 ...	13	6
S 12	3.0 ...	4	0	9.30 ...	13	6	3.30 ...	6	0	10.0 ...	14	0
13	4.0 ...	3	0	10.30 ...	14	3	4.15 ...	6	0	10.45 ...	14	3
14	4.45 ...	2	6	11.15 ...	15	0	5.30 ...	6	0	11.45 ...	14	6
15	5.45 ...	2	0	11.45 ...	15	6	5.45 ...	6	5	0.0 ...	0	0
16	0.15 ...	14	3	6.0 ...	2	0	0.30 ...	15	6	6.30 ...	6	6
17	0.30 ...	14	3	6.30 ...	2	6	1.0 ...	15	3	7.0 ...	6	9
18	1.0 ...	14	0	7.15 ...	3	3	1.30 ...	14	9	7.15 ...	6	9
19	1.15 ...	13	0	7.30 ...	3	3	1.30 ...	14	0	7.15 ...	7	6
20	1.30 ...	12	3	7.30 ...	4	3	1.30 ...	13	9	8.45 ...	7	9
21	2.45 ...	12	0	8.45 ...	4	6	2.45 ...	13	6	9.0 ...	8	0
22	3.0 ...	11	9	9.15 ...	5	6	3.15 ...	13	0	9.15 ...	8	6
23	3.15 ...	10	11	9.15 ...	6	6	4.30 ...	12	9	10.30 ...	8	9
24	4.30 ...	10	9	10.30 ...	6	6	5.30 ...	12	9	11.30 ...	8	9
25	5.30 ...	10	9	11.30 ...	7	0	6.30 ...	12	6	0.0 ...	0	0
26	0.30 ...	6	0	7.0 ...	11	6	1.0 ...	7	0	7.45 ...	13	3
S 27	1.30 ...	5	0	8.0 ...	13	0	1.45 ...	6	9	8.30 ...	14	0
28	2.45 ...	4	0	8.45 ...	14	6	3.0 ...	6	3	9.30 ...	14	6
29	3.30 ...	3	0	10.0 ...	15	6	4.0 ...	6	3	10.30 ...	15	0
30	4.30 ...	2	0	11.0 ...	16	9	5.30 ...	6	0	11.30 ...	15	6
31	5.45 ...	1	0	11.45 ...	17	3	6.0 ...	6	0	0.0 ...	0	0

JUNE 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.15 A.M.	16	0	6.30 A.M.	1	0	0.30 P.M.	17	6	7.0 P.M.	6	0
2	1.0 ...	16	3	7.30 ...	1	6	1.30 ...	17	0	7.30 ...	6	6
3	1.30 ...	15	9	8.0 ...	2	0	2.0 ...	16	6	7.30 ...	7	2
4	2.30 ...	15	3	8.15 ...	3	6	2.45 ...	15	6	8.45 ...	7	6
5	2.45 ...	14	6	9.30 ...	5	6	3.30 ...	15	3	9.45 ...	7	9
6	4.0 ...	13	6	10.30 ...	7	3	5.0 ...	15	3	10.30 ...	8	9
7	5.30 ...	13	3	10.45 ...	8	3	5.30 ...	14	6	11.30 ...	9	0
8	6.0 ...	13	0	11.30 ...	8	9	6.0 ...	14	0	11.45 ...	9	0
9	6.30 ...	12	9	0.0 ...	0	0	1.0 ...	9	3	8.0 ...	13	9
10	1.45 ...	7	0	8.0 ...	14	0	1.45 ...	8	9	9.0 ...	13	9
S 11	3.0 ...	5	0	9.30 ...	14	3	3.0 ...	8	4	9.30 ...	13	9
12	3.30 ...	4	0	10.0	14	9	4.0 ...	8	0	10.0 ...	13	9
13	4.0 ...	4	0	11.0 ...	15	3	5.30 ...	8	0	11.30 ...	13	6
14	5.30 ...	4	0	11.45 ...	15	3	5.30 ...	7	8	11.45 ...	13	6
15	6.0 ...	4	0	0.0 ...	0	0	0.15 ...	15	9	7.0 ...	8	3
16	0.15 ...	13	6	7.0 ...	4	3	1.0 ...	15	9	7.30 ...	8	6
17	1.30 ...	13	3	7.30 ...	4	6	1.45 ...	15	9	8.0 ...	8	9
18	2.45 ...	12	3	8.15 ...	4	9	3.0 ...	15	6	9.30 ...	9	0
19	3.30 ...	11	9	9.30 ...	5	3	3.45 ...	14	9	9.30 ...	9	3
20	4.15 ...	11	6	9.30 ...	6	0	4.30 ...	14	6	9.45 ...	7	9
21	4.30 ...	11	6	10.0 ...	7	0	5.0 ...	14	3	10.45 ...	7	3
22	5.0 ...	12	3	11.0 ...	8	3	5.30 ...	14	9	11.30 ...	7	0
23	5.30 ...	12	3	11.30 ...	8	0	6.0 ...	14	6	11.45 ...	6	9
24	6.30 ...	13	0	0.0 ...	0	0	0.30 ...	8	0	7.30 ...	14	0
25	1.0 ...	5	6	8.0 ...	13	9	1.0 ...	8	3	9.0 ...	13	9
S 26	1.15 ...	5	0	8.45 ...	15	6	1.30 ...	8	0	9.30 ...	14	0
27	1.30 ...	4	9	9.45 ...	16	0	3.30 ...	7	6	10.15 ...	14	3
28	4.0 ...	2	0	10.30 ...	16	9	4.0 ...	6	9	11.0 ...	14	6
29	4.15 ...	1	0	11.15 ...	17	0	5.30 ...	5	9	11.45 ...	14	9
30	6.0 ...	1	6	0.0 ...	0	0	0.15 ...	17	0	6.30 ...	5	6

JULY 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.30 A.M.	14	9	6.30 A.M.	1	0	1.0 P.M.	16	9	7.0 P.M.	5	3
2	1.30 ...	14	6	7.30 ...	2	0	2.0 ...	16	6	7.45 ...	5	6
3	2.0 ...	14	3	8.0 ...	3	6	2.30 ...	16	0	8.45 ...	5	9
4	2.30 ...	13	6	8.30 ...	6	3	3.45 ...	15	3	9.30 ...	6	0
5	3.30 ...	13	0	9.30 ...	7	0	4.15 ...	14	6	9.45 ...	6	0
6	4.45 ...	12	6	10.0 ...	8	0	5.30 ...	14	6	11.0 ...	6	6
7	6.0 ...	12	3	11.30 ...	8	6	6.0 ...	13	0	0.0 ...	0	0
8	0.30 ...	7	0	7.0 ...	13	0	1.0 ...	9	0	7.0 ...	14	6
9	1.0 ...	7	0	8.0 ...	12	3	1.30 ...	9	0	8.45 ...	12	0
S 10	2.0 ...	5	6	9.30 ...	13	6	2.45 ...	9	0	9.30 ...	12	6
11	2.30 ...	5	0	9.45 ...	14	0	3.45 ...	8	6	10.0 ...	12	9
12	4.0 ...	4	0	10.30 ...	14	6	4.30 ...	8	2	11.0 ...	13	3
13	5.0 ...	3	9	11.0 ...	15	0	5.15 ...	7	9	11.30 ...	13	6
14	5.30 ...	3	9	11.30 ...	15	0	5.30 ...	7	9	0.0 ...	0	0
15	0.15 ...	13	6	6.0 ...	3	6	0.45 ...	15	0	6.30 ...	7	3
16	0.30 ...	13	9	6.30 ...	4	0	1.0 ...	15	0	7.30 ...	6	9
17	1.30 ...	13	3	7.30 ...	4	3	1.30 ...	14	9	7.30 ...	6	6
18	2.0 ...	13	0	7.45 ...	4	6	2.0 ...	14	6	8.30 ...	7	0
19	2.30 ...	12	9	8 15 ...	5	0	2.45 ...	14	6	9.15 ...	7	3
20	3.15 ...	12	9	9.15 ...	5	6	3.45 ...	13	6	9.45 ...	5	6
21	4.0 ...	12	6	10.0 ...	7	3	4.15 ...	13	3	10.30 ...	6	6
22	4.30 ...	12	0	10.30 ...	8	6	5.30 ...	13	0	11.30 ...	6	9
23	5.30 ...	12	0	11.30 ...	8	9	6.30 ...	12	6	0.0 ...	0	0
24	0.30 ...	5	0	7.30 ...	13	9	1.0 ...	9	0	8.0 ...	12	9
S 25	1.30 ...	4	0	8.0 ...	14	6	2.30 ...	8	0	8.45 ...	12	9
26	2.45 ...	3	3	9.30 ...	15	0	3.30 ...	7	3	9.45 ...	13	0
27	3.45 ...	2	6	10.15 ...	15	9	4.45 ...	6	3	10.45 ...	13	9
28	4.30 ...	1	0	11.30 ...	16	3	5.30 ...	5	0	11.30 ...	14	6
29	5.45 ...	1	0	11.45 ...	16	6	6.30 ...	4	6	0.0 ...	0	0
30	0.30 ...	14	9	6.30 ...	1	0	1.0 ...	16	9	6.30 ...	4	0
31	0.45 ...	15	3	7.0 ...	2	0	1.15 ...	16	6	7.30 ...	3	9

AUGUST 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.30 A.M.	15	0	7.45 A.M.	3	0	2.0 P.M.	16	0	8.0 P.M.	4	6
2	2.0 ...	14	6	8.15 ...	4	0	3.0 ...	15	0	9.0 ...	5	0
3	3.0 ...	14	0	9.15 ...	6	0	3.30 ...	14	0	9.45 ...	5	6
4	3.45 ...	12	6	10.15 ...	8	0	4.15 ...	13	0	10.30 ...	6	0
5	4.30 ...	12	0	11.0 ...	9	0	5.30 ...	12	0	11.30 ...	6	9
6	6.30 ...	11	7	0.0 ...	0	0	0.30 ...	9	6	7.30 ...	11	6
7	1.30 ...	7	6	7.45 ...	12	3	1.30 ...	9	0	8.0 ...	11	6
8	2.0 ...	7	6	8.30 ...	13	0	2.30 ...	9	0	9.0 ...	11	9
S 9	2.30 ...	6	0	9.30 ...	13	6	2.45 ...	8	6	9.45 ...	12	3
10	3.30 ...	5	0	10.0 ...	14	3	4.30 ...	8	0	10.30 ...	12	9
11	4.30 ...	4	6	10.45 ...	15	0	5.30 ...	7	6	11.30 ...	13	0
12	5.15 ...	4	0	11.30 ...	15	6	5.45 ...	7	0	11.45 ...	13	6
13	6.0 ...	3	9	11.45 ...	15	9	6.0 ...	6	0	0.0 ...	0	0
14	0.15 ...	13	9	6.15 ...	3	9	0.30 ...	16	0	6.45 ...	5	9
15	0.30 ...	13	9	7.0 ...	3	9	1.0 ...	16	0	7.0 ...	5	6
16	1.30 ...	13	6	7.15 ...	5	0	1.30 ...	15	9	7.45 ...	4	6
17	2.30 ...	13	6	8.0 ...	5	6	2.30 ...	15	3	9.0 ...	5	0
18	3.0 ...	13	3	9.0 ...	6	0	3.15 ...	15	0	9.15 ...	5	3
19	3.15 ...	12	9	9.15 ...	6	6	3.30 ...	14	0	9.45 ...	6	9
20	3.45 ...	12	6	9.45 ...	7	9	4.0 ...	13	6	10.30 ...	5	6
21	4.30 ...	13	0	11.0 ...	8	6	6.0 ...	12	6	11.30 ...	6	0
22	6.0 ...	13	0	0.0 ...	0	0	1.0 ...	9	0	8.0 ...	13	0
23	2.0 ...	5	6	8.0 ...	13	9	2.0 ...	8	9	9.0 ...	13	0
S 24	3.0 ...	4	0	9.45 ...	15	0	3.30 ...	7	0	9.45 ...	14	0
25	3.45 ...	3	0	10.0 ...	16	3	4.30 ...	6	0	10.30 ...	15	0
26	4.30 ...	2	6	11.0 ...	17	0	5.0 ...	5	3	11.0 ...	15	6
27	5.0 ...	2	0	11.30 ...	17	3	5.45 ...	4	6	11.45 ...	16	6
28	6.0 ...	1	6	0.0 ...	0	0	0.15 ...	17	3	6.30 ...	3	6
29	0.30 ...	16	9	6.30 ...	3	6	1.0 ...	16	9	7.0 ...	3	6
30	1.0 ...	16	9	7.30 ...	4	6	1.30 ...	16	3	7.45 ...	4	0
31	1.45 ...	16	0	8.15 ...	5	9	2.30 ...	15	3	8.15 ...	4	6

SEPTEMBER 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.0 A.M.	15	0	8.45 A.M.	7	9	2.45 P.M.	14	3	9.0 P.M.	5	0
2	3.0 ...	14	0	9.15 ...	9	0	4.0 ...	13	0	10.15 ...	5	9
3	4.30 ...	12	0	11.45 ...	9	6	5.0 ...	12	6	11.0 ...	6	0
4	5.30 ...	12	0	0.0 ...	0	0	0.15 ...	9	6	6.30 ...	11	9
5	1.30 ...	7	0	7.0 ...	12	0	1.30 ...	9	3	7.45 ...	11	6
6	2.0 ...	6	9	8.0 ...	12	6	2.0 ...	8	9	8.30 ...	12	0
7	2.15 ...	6	6	9.0 ...	13	0	2.15 ...	8	9	9.0 ...	12	0
S 8	3.0 ...	6	0	9.30 ...	13	9	3.30 ...	7	9	9.45 ...	12	9
9	3.45 ...	4	9	10.0 ...	14	9	4.0 ...	6	6	10.15 ...	13	6
10	4.30 ...	4	0	11.0 ...	15	3	5.0 ...	5	0	11.0 ...	14	6
11	5.15 ...	3	6	11.30 ...	15	6	5.30 ...	4	6	11.30 ...	15	0
12	5.45 ...	4	0	0.0 ...	0	0	0.15 ...	15	8	6.0 ...	3	6
13	0.15 ...	15	3	6.30 ...	3	0	0.30 ...	15	6	7.0 ...	4	3
14	0.30 ...	15	3	7.0 ...	5	0	0.45 ...	14	9	7.30 ...	3	0
15	1.0 ...	14	6	8.30 ...	6	0	1.30 ...	14	6	8.0 ...	3	6
16	2.0 ...	14	6	9.15 ...	4	0	2.45 ...	13	9	9.15 ...	7	0
17	3.0 ...	12	3	10.0 ...	3	3	4.0 ...	12	6	10.30 ...	7	0
18	3.45 ...	12	0	11.0 ...	5	6	5.0 ...	12	0	11.30 ...	7	0
19	6.30 ...	11	6	11.45 ...	6	0	6.0 ...	13	0	11.45 ...	8	0
20	7.0 ...	11	0	0.0 ...	0	0	1.0 ...	8	0	6.45 ...	12	3
21	1.15 ...	5	0	8.0 ...	13	6	3.0 ...	7	0	9.0 ...	12	6
22	3.0 ...	5	0	9.15 ...	14	3	3.0 ...	6	0	9.15 ...	13	0
S 23	3.30 ...	4	9	9.30 ...	15	3	4.0 ...	4	6	10.0 ...	14	6
24	4.0 ...	4	0	10.30 ...	15	9	5.0 ...	4	0	11.0 ...	15	6
25	5.30 ...	3	0	11.30 ...	16	3	5.45 ...	2	6	11.45 ...	15	9
26	6.0 ...	4	0	0.0 ...	0	0	0.15 ...	16	0	6.30 ...	2	3
27	0.30 ...	15	9	6.30 ...	4	0	0.45 ...	15	3	7.0 ...	3	0
28	1.30 ...	15	3	7.15 ...	4	6	1.30 ...	14	3	7.30 ...	3	6
29	1.45 ...	14	9	7.45 ...	5	6	2.0 ...	13	3	8.15 ...	4	0
30	2.30 ...	14	0	8.30 ...	6	6	2.30 ...	12	0	8.45 ...	4	9

OCTOBER 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.0 A.M.	13	3	9.15 A.M.	6	9	3.0 P.M.	11	6	9.30 P.M.	5	6
2	3.30 ...	12	0	9.30 ...	8	9	3.30 ...	11	0	9.45 ...	6	0
3	4.0 ...	11	9	11.0 ...	9	0	4.45 ...	10	6	10.30 ...	7	6
4	4.45 ...	11	6	11.45 ...	9	0	7.0 ...	10	0	11.45 ...	7	9
5	7.15 ...	11	6	0.0 ...	0	0	1.0 ...	8	6	6.30 ...	10	6
6	1.30 ...	7	0	8.0 ...	12	3	1.15 ...	6	6	7.45 ...	11	6
S 7	2.30 ...	5	6	8.30 ...	13	3	2.30 ...	6	0	9.15 ...	12	6
8	3.15 ...	4	6	10.0 ...	14	3	3.30 ...	6	0	10.0 ...	14	0
9	4.45 ...	4	6	10.15 ...	14	9	4.45 ...	4	0	10.30 ...	15	0
10	4.30 ...	3	6	10.45 ...	15	3	5.0 ...	2	6	11.0 ...	15	8
11	5.30 ...	4	6	11.30 ...	15	6	5.45 ...	2	0	11.30 ...	16	0
12	6.0 ...	5	0	11.45 ...	15	6	6.30 ...	1	6	0.0 ...	0	0
13	0.30 ...	16	8	6.30 ...	5	0	0.30 ...	15	3	7.0 ...	1	0
14	1.0 ...	16	6	7.15 ...	6	0	1.15 ...	14	6	7.30 ...	1	6
15	1.45 ...	16	0	8.0 ...	7	0	2.0 ...	14	0	8.30 ...	4	0
16	2.15 ...	14	6	8.30 ...	8	0	2.15 ...	13	6	8.45 ...	4	6
17	2.45 ...	13	0	9.30 ...	8	6	5.0 ...	11	6	11.0 ...	5	0
18	5.30 ...	13	0	11.30 ...	8	0	5.30 ...	11	0	11.45 ...	5	6
19	6.0 ...	12	9	11.45 ...	9	9	6.0 ...	11	9	0.0 ...	0	0
20	0.30 ...	6	0	6.30 ...	13	9	2.0 ...	8	0	8.0 ...	13	0
S 21	2.0 ...	5	6	8.15 ...	14	6	3.0 ...	5	0	9.30 ...	14	0
22	3.30 ...	5	0	9.30 ...	15	3	4.0 ...	4	0	10.0 ...	15	6
23	4.0 ...	2	6	10.0 ...	15	6	4.30 ...	2	6	11.0 ...	16	0
24	4.30 ...	4	0	11.0 ...	15	6	5.0 ...	2	3	11.30 ...	16	6
25	5.30 ...	3	6	11.30 ...	15	3	5.45 ...	2	0	11.45 ...	16	9
26	6.0 ...	6	0	0.0 ...	0	0	0.15 ...	14	9	7.0 ...	2	6
27	1.0 ...	16	6	7.0 ...	6	6	1.0 ...	14	3	7.15 ...	3	6
28	1.15 ...	16	0	7.15 ...	7	6	1.30 ...	13	9	7.30 ...	5	0
29	1.30 ...	15	3	7.45 ...	7	6	1.45 ...	12	10	7.45 ...	5	9
30	1.45 ...	14	6	9.15 ...	6	3	3.0 ...	13	6	9.15 ...	7	0
31	3.0 ...	11	0	9.30 ...	7	0	4.0 ...	12	0	9.45 ...	9	0

NOVEMBER 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.0 A.M.	10	6	10.30 A.M.	8	6	4.0 P.M.	10	6	10.30 P.M.	6	6
2	5.0 ...	11	9	11.0 ...	9	30	5.30 ...	9	9	11.30 ...	8	0
3	2.30 ...	12	8	11.30 ...	8	15	6.30 ...	9	10	0.0 ...	0	0
S 4	0.15 ...	8	0	7.30 ...	12	9	2.0 ...	7	0	8.0 ...	11	9
5	2.3 ...	7	6	8.15 ...	13	3	2.15 ...	5	9	9.0 ...	13	0
6	3.0 ...	7	0	9.30 ...	14	0	3.30 ...	4	6	9.45 ...	14	6
7	3.30 ...	6	9	9.45 ...	14	6	4.0 ...	3	6	10.0 ...	15	6
8	4.0 ...	6	0	10.0 ...	14	9	4.15 ...	1	0	11.30 ...	16	6
9	4.30 ...	5	6	11.30 ...	15	0	5.0 ...	1	0	11.45 ...	17	0
10	5.30 ...	5	0	0.0 ...	0	0	0.15 ...	15	3	5.30 ...	1	0
11	0.15 ...	17	3	6.30 ...	5	6	0.30 ...	14	9	7.0 ...	1	0
12	1.0 ...	17	0	7.30 ...	7	0	1.0 ...	14	0	7.0 ...	1	0
13	1.45 ...	16	6	7.45 ...	7	0	2.0 ...	13	6	8.30 ...	1	6
14	2.30 ...	16	0	8.30 ...	7	6	2.30 ...	12	6	9.30 ...	4	0
15	3.30 ...	14	6	10.15 ...	7	9	4.0 ...	12	0	10.30 ...	4	9
16	4.30 ...	14	0	10.45 ...	8	6	5.0 ...	11	0	11.30 ...	5	6
17	5.45 ...	13	9	11.45 ...	7	0	6.30 ...	11	9	0.0 ...	0	0
18	1.0 ...	7	0	6.30 ...	12	6	1.30 ...	5	0	7.30 ...	12	8
19	1.30 ...	7	0	8.0 ...	14	0	1.45 ...	4	6	8.45 ...	14	0
S 20	2.15 ...	7	0	9.0 ...	14	3	2.30 ...	4	0	9.45 ...	15	3
21	3.30 ...	6	6	9.45 ...	14	3	3.45 ...	3	6	10.15 ...	16	0
22	3.45 ...	5	9	10.30 ...	14	3	5.0 ...	3	0	11.30 ...	16	3
23	5.30 ...	5	6	11.30 ...	14	0	5.45 ...	2	0	11.45 ...	16	3
24	5.45 ...	5	6	11.45 ...	14	0	6.0 ...	2	0	0.0 ...	0	0
25	0.15 ...	16	3	6.30 ...	6	9	0.15 ...	13	9	6.30 ...	3	6
26	0.45 ...	16	0	6.45 ...	7	0	0.45 ...	13	4	7.0 ...	4	6
27	1.30 ...	15	6	7.30 ...	6	6	1.45 ...	12	9	7.30 ...	5	6
28	2.0 ...	14	9	8.0 ...	7	0	2.30 ...	12	9	8.45 ...	6	0
29	3.0 ...	14	0	9.0 ...	7	6	3.0 ...	11	0	9.30 ...	6	6
30	3.30 ...	13	0	9.45 ...	7	6	4.0 ...	10	9	10.0 ...	6	0

DECEMBER 1836.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.30 A.M.	12	0	11.0 A.M.	8	0	5.0 P.M.	10	8	11.30 P.M.	6	6
2	6.0 ...	13	0	11.45 ...	8	0	6.0 ...	11	0	0.0 ...	0	0
3	0.15 ...	6	6	6.30 ...	13	3	0.30 ...	8	6	7.0 ...	12	3
4	2.0 ...	7	0	7.30 ...	13	6	2.15 ...	5	0	8.45 ...	13	6
S 5	2.30 ...	6	6	8.45 ...	13	10	2.45 ...	4	0	9.0 ...	15	0
6	3.0 ...	6	0	9.0 ...	14	3	3.15 ...	3	6	10.0 ...	16	0
7	4.0 ...	5	9	10.0 ...	14	6	4.0 ...	2	6	10.30 ...	16	9
8	4.30 ...	5	6	10.45 ...	15	0	5.0 ...	1	0	11.0 ...	17	3
9	5.0 ...	5	3	11.0 ...	15	3	5.45 ...	1	0	11.45 ...	17	6
10	5.30 ...	4	9	11.45 ...	15	3	6.30 ...	1	0	0.0 ...	0	0
11	0.45 ...	16	9	6.45 ...	6	0	1.0 ...	15	3	7.30 ...	1	0
12	1.30 ...	17	4	8.0 ...	7	0	2.0 ...	14	8	9.30 ...	4	0
13	3.0 ...	16	6	9.45 ...	5	6	3.30 ...	13	6	9.0 ...	4	6
14	3.0 ...	15	9	10.30 ...	7	6	3.45 ...	12	10	10.30 ...	7	0
15	3.45 ...	15	3	11.0 ...	6	0	5.30 ...	12	2	11.30 ...	7	0
16	5.30 ...	13	8	11.30 ...	5	9	6.0 ...	11	9	0.0 ...	0	0
17	0.15 ...	7	6	6.30 ...	13	6	0.30 ...	5	6	6.45 ...	12	10
18	1.0 ...	8	0	7.0 ...	13	0	1.30 ...	5	0	8.0 ...	13	6
S 19	2.0 ...	7	9	8.0 ...	12	6	2.0 ...	4	0	9.15 ...	14	3
20	3.15 ...	7	6	9.15 ...	12	9	3.30 ...	3	6	10.0 ...	15	9
21	3.45 ...	6	9	10.0 ...	13	0	4.30 ...	3	6	10.30 ...	15	6
22	4.30 ...	6	6	10.30 ...	13	3	5.0 ...	3	0	11.0 ...	15	9
23	5.0 ...	6	0	11.0 ...	13	3	6.30 ...	3	0	11.45 ...	15	9
24	5.45 ...	5	9	0.0 ...	0	0	0.15 ...	12	9	6 30 ...	3	9
25	0.30 ...	15	9	6.30 ...	6	6	0.45 ...	12	9	7.0 ...	4	0
26	1.0 ...	15	6	7.0 ...	6	0	1.0 ...	12	6	7.30 ...	3	9
27	1.30 ...	15	3	7.45 ...	6	6	2.0 ...	12	9	8.0 ...	5	0
28	2.0 ...	15	2	8.0 ...	7	0	2.30 ...	12	6	8.30 ...	5	6
29	2.30 ...	14	9	8.45 ...	6	6	3.0 ...	11	9	10.0 ...	7	0
30	3.15 ...	14	6	10.0 ...	6	0	3.30 ...	11	9	10.45 ...	7	6
31	4.15 ...	13	6	10.45 ...	6	6	5.0 ...	11	6	11.0 ...	8	0

JANUARY 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.30 A.M.	13	0	0.0 A.M.	0	0	0.30 P.M.	5	9	7.0 P.M.	11	3
2	0.30 ...	7	9	7.15 ...	13	6	1.30 ...	5	0	8.0 ...	12	3
3	2.0 ...	9	0	8.0 ...	13	0	2.15 ...	4	3	8.30 ...	14	0
S 4	2.30 ...	8	3	8.30 ...	13	0	2.45 ...	4	0	9.45 ...	15	6
5	3.30 ...	8	6	9.45 ...	13	6	4.0 ...	2	6	10.0 ...	16	0
6	4.0 ...	7	9	10.30 ...	14	0	4.15 ...	1	6	11.30 ...	17	0
7	5.30 ...	6	0	11.30 ...	14	9	5.30 ...	1	0	0.0 ...	0	0
8	0.15 ...	17	6	6.0 ...	5	9	0.30 ...	15	6	6.30 ...	1	0
9	0.45 ...	18	0	7.0 ...	5	6	1.15 ...	15	9	7.0 ...	2	0
10	1.15 ...	18	0	7.15 ...	5	0	1.30 ...	15	3	8.0 ...	3	0
11	2.0 ...	17	6	9.0 ...	4	3	2.30 ...	15	3	9.0 ...	4	6
12	2.30 ...	16	6	9.30 ...	4	3	3.30 ...	13	6	9.30 ...	4	9
13	3.30 ...	15	6	9.45 ...	4	9	5.30 ...	13	0	10.45 ...	6	9
14	5.0 ...	14	3	10.0 ...	5	3	6.0 ...	12	0	11.45 ...	7	6
15	6.15 ...	13	0	0.0 ...	0	0	0.30 ...	5	0	6.30 ...	11	6
16	0.45 ...	8	0	6.45 ...	12	0	1.0 ...	5	3	7.0 ...	12	6
17	1.15 ...	7	9	7.30 ...	11	3	2.0 ...	5	0	8.30 ...	12	9
S 18	2.30 ...	7	6	8.30 ...	11	0	2.30 ...	4	6	9.30 ...	13	9
19	3.30 ...	7	0	9.30 ...	11	6	3.30 ...	4	3	10.15 ...	14	9
20	3.45 ...	6	9	10.30 ...	12	3	4.0 ...	3	9	11.0 ...	15	0
21	5.0 ...	6	9	11.15 ...	12	9	4.45 ...	3	3	11.30 ...	15	3
22	5.30 ...	6	6	11.45 ...	13	3	5.30 ...	1	6	0.0 ...	0	0
23	0.15 ...	15	6	6.0 ...	6	0	0.15 ...	13	6	6.30 ...	2	10
24	0.30 ...	15	6	6.30 ...	5	7	0.45 ...	13	6	7.0 ...	2	6
25	1.0 ...	15	3	7.0 ...	5	3	1.0 ...	13	3	7.45 ...	3	0
26	1.30 ...	15	0	8.0 ...	5	0	2.0 ...	13	0	8.30 ...	4	3
27	2.30 ...	15	3	8.30 ...	5	3	2.45 ...	13	3	9.0 ...	6	0
28	3.0 ...	15	0	9.0 ...	5	6	3.0 ...	12	6	9.30 ...	6	0
29	3.30 ...	14	9	9.15 ...	4	10	3.45 ...	12	6	10.0 ...	8	5
30	4.15 ...	13	3	10.30 ...	5	3	5.0 ...	11	3	11.0 ...	8	6
31	6.0 ...	12	9	11.15 ...	5	6	7.0 ...	13	0	0.0 ...	0	0

FEBRUARY 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.0 A.M.	9	0	7.15 A.M.	12	0	1.30 P.M.	5	3	8.0 P.M.	13	9
S 2	1.30 ...	8	6	8.15 ...	12	3	2.0 ...	3	9	9.0 ...	14	9
3	3.0 ...	8	0	9.0 ...	12	9	3.0 ...	2	0	9.15 ...	15	9
4	4.0 ...	7	6	10.0 ...	14	6	4.0 ...	1	6	9.30 ...	17	0
5	3.0 ...	4	6	9.0 ...	15	3	5.0 ...	1	3	11.30 ...	18	0
6	5.30 ...	4	6	11.30 ...	16	0	5.30 ...	1	0	0.0 ...	0	0
7	0.30 ...	18	0	6.30 ...	3	6	0.30 ...	16	0	7.0 ...	1	6
8	1.0 ...	17	9	7.15 ...	2	9	1.30 ...	16	0	7.30 ...	3	0
9	1.30 ...	17	6	7.30 ...	3	6	1.30 ...	15	6	7.45 ...	4	0
10	2.30 ...	16	6	8.30 ...	3	6	3.0 ...	14	9	8.30 ...	4	6
11	3.30 ...	15	9	9.30 ...	4	0	3.30 ...	15	0	9.45 ...	5	6
12	3.45 ...	12	9	10.30 ...	6	0	4.30 ...	12	3	11.45 ...	6	9
13	4.45 ...	11	3	11.30 ...	6	0	6.0 ...	12	0	0.0 ...	0	0
14	0.15 ...	6	0	6.0 ...	12	0	0.15 ...	6	0	7.0 ...	12	0
15	1.30 ...	7	0	7.30 ...	11	6	1.30 ...	6	0	8.15 ...	12	0
16	2.0 ...	8	0	8.30 ...	11	3	2.30 ...	5	9	9.0 ...	13	3
S 17	3.15 ...	7	6	9.0 ...	11	3	3.30 ...	4	8	10.0 ...	13	9
18	3.30 ...	6	6	10.15 ...	11	9	4.15 ...	4	0	11.0 ...	14	9
19	4.30 ...	6	0	11.30 ...	12	3	5.30 ...	3	4	11.30 ...	15	0
20	5.30 ...	5	6	11.45 ...	13	3	5.45 ...	2	6	0.0 ...	0	0
21	0.15 ...	15	4	6.0 ...	4	6	0.15 ...	14	0	6.30 ...	4	0
22	0.30 ...	16	0	7.0 ...	4	6	0.45 ...	14	9	7.30 ...	4	0
23	1.30 ...	16	0	7.30 ...	4	6	1.30 ...	14	9	7.45 ...	5	0
24	1.45 ...	15	9	7.45 ...	4	0	1.45 ...	14	6	8.30 ...	5	6
25	2.0 ...	15	6	8.45 ...	4	0	2.30 ...	14	3	9.0 ...	6	0
26	3.0 ...	15	0	9.0 ...	3	6	3.0 ...	14	0	9.30 ...	6	6
27	3.30 ...	14	6	9.30 ...	4	0	4.0 ...	13	9	10.0 ...	7	0
28	4.0 ...	14	0	10.0 ...	4	6	4.15 ...	12	6	11.30 ...	7	6

MARCH 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.30 A.M.	12	0	11.30 A.M.	6	0	6.30 P.M.	12	0	11.45 P.M.	7	6
2	6.30 ...	11	6	0.0 ...	0	0	0.30 ...	5	3	8.15 ...	13	9
3	2.15 ...	7	0	8.15 ...	12	0	2.15 ...	4	6	9.30 ...	14	6
S 4	2.45 ...	6	9	9.30 ...	12	9	4.0 ...	3	6	10.0 ...	15	6
5	4.0 ...	6	0	10.0 ...	14	3	4.0 ...	2	6	11.0 ...	16	6
6	5.0 ...	5	6	11.0 ...	15	6	5.0 ...	2	0	11.45 ...	17	6
7	5.45 ...	4	0	0.0 ...	0	0	0.15 ...	16	3	6.0 ...	2	0
8	0.30 ...	17	9	6.30 ...	2	0	0.30 ...	16	3	6.30 ...	2	6
9	0.45 ...	17	3	6.45 ...	2	6	0.45 ...	16	0	7.15 ...	2	0
10	1.30 ...	16	9	9.30 ...	1	0	1.30 ...	15	9	8.45 ...	3	0
11	2.0 ...	16	3	9.0 ...	2	0	2.30 ...	15	0	9.0 ...	5	0
12	3.0 ...	14	6	9.15 ...	4	0	3.30 ...	14	3	10.0 ...	6	0
13	4.0 ...	13	3	10.30 ...	4	6	4.30 ...	12	10	10.30 ...	6	6
14	4.30 ...	12	6	10.45 ...	5	9	4.15 ...	12	0	11.0 ...	7	0
15	5.0 ...	11	6	11.30 ...	6	3	6.0 ...	11	9	11.45 ...	7	6
16	6.0 ...	11	0	0.0 ...	0	0	0.30 ...	6	9	7.30 ...	12	0
17	0.30 ...	8	0	7.45 ...	10	6	1.0 ...	6	9	8.30 ...	12	9
18	2.30 ...	7	9	8.30 ...	11	0	2.0 ...	5	3	9.0 ...	13	0
S 19	3.0 ...	7	0	9.45 ...	12	3	2.30 ...	5	0	9.45 ...	14	3
20	4.0 ...	6	6	10.0 ...	12	9	3.30 ...	4	6	10.0 ...	15	0
21	5.0 ...	5	0	11.30 ...	14	0	5.0 ...	4	6	11.30 ...	5	9
22	5.30 ...	4	6	11.45 ...	15	0	5.30 ...	4	0	0.0 ...	0	0
23	0.15 ...	16	0	6.0 ...	3	6	0.15 ...	15	6	6.15 ...	3	0
24	0.30 ...	16	3	6.45 ...	3	0	0.45 ...	16	0	7.0 ...	3	0
25	1.0 ...	16	0	7.0 ...	2	6	1.15 ...	16	0	7.30 ...	4	0
26	1.30 ...	15	6	7.45 ...	2	6	1.45 ...	15	6	8.0 ...	5	0
27	1.45 ...	14	6	8.15 ...	2	6	2.15 ...	14	6	8.30 ...	5	0
28	2.30 ...	13	6	8.45 ...	3	3	3.30 ...	13	9	9.45 ...	6	6
29	3.45 ...	12	6	10.15 ...	4	8	4.15 ...	13	3	10.15 ...	7	0
30	4.15 ...	12	0	10.30 ...	5	6	5.30 ...	12	3	10.45 ...	6	9
31	5.30 ...	11	3	11.45 ...	5	8	7.15 ...	13	3	0.0 ...	0	0

APRIL 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.30 A.M.	7	0	7.45 A.M.	11	3	1.45 P.M.	4	6	8.45 P.M.	14	3
S 2	2.30 ...	6	0	9.15 ...	13	3	3.0 ...	4	6	9.15 ...	15	6
3	3.15 ...	5	6	10.0 ...	14	6	4.0 ...	3	6	10.0 ...	16	0
4	4.6 ...	3	6	10.30 ...	16	0	4.30 ...	3	3	11.0 ...	16	10
5	5.0 ...	2	0	11.15 ...	16	10	5.30 ...	3	9	11.45 ...	17	0
6	6.0 ...	1	9	0.0 ...	0	0	0.30 ...	17	0	6.0 ...	4	6
7	0.30 ...	16	9	6.30 ...	1	9	1.0 ...	16	9	7.15 ...	4	0
8	1.30 ...	16	9	7.30 ...	2	0	1.45 ...	16	3	7.30 ...	5	0
9	2 0 ...	14	9	7.45 ...	2	6	2.15 ...	15	6	8.30 ...	6	0
10	2.30 ...	13	6	8.30 ...	3	9	2.30 ...	14	3	9.0 ...	6	6
11	3.0 ...	13	0	9.0 ...	5	0	3.0 ...	13	6	9.30 ...	6	6
12	3.30 ...	12	6	9.30 ...	6	6	4.45 ...	12	0	11.0 ...	7	9
13	5.0 ...	11	6	11.0 ...	6	6	6.0 ...	11	0	11.45 ...	6	0
14	6.0 ...	10	0	11.45 ...	6	9	6.45 ...	11	6	0.0 ...	0	0
15	0.30 ...	5	6	6.45 ...	10	6	1.0 ...	6	6	8.0 ...	12	0
16	1.0 ...	7	0	8.15 ...	11	0	2.0 ...	6	0	8.45 ...	12	6
S 17	2.30 ...	6	6	9.0 ...	12	0	3.15 ...	5	9	10.30 ...	13	6
18	3.30 ...	4	9	10.0 ...	13	3	3.45 ...	6	0	10.45 ...	14	6
19	4.0 ...	4	0	10.45 ...	14	6	4.30 ...	5	6	11.0 ...	15	0
20	5.15 ...	3	9	11.0 ...	15	6	5.0 ...	5	0	11.30 ...	15	6
21	5.45 ...	2	6	11.45 ...	16	0	5.15 ...	5	0	0.0 ...	0	0
22	0.30 ...	15	9	5.45 ...	2	0	0.30 ...	16	3	7.0 ...	5	9
23	1.0 ...	15	9	7.30 ...	1	6	1.30 ...	16	3	7.15 ...	6	3
24	1.45 ...	15	3	7.30 ...	1	6	1.45 ...	15	9	8.0 ...	6	9
25	2.0 ...	14	6	8.15 ...	2	6	2.15 ...	14	9	8.30 ...	7	0
26	2.30 ...	14	0	8.30 ...	3	6	2.30 ...	13	9	9.0 ...	7	0
27	3.0 ...	12	3	9.30 ...	5	0	3.30 ...	13	6	10.0 ...	7	0
28	4.0 ...	12	0	10.0 ...	5	6	5.30 ...	13	6	11.45 ...	7	3
29	6.0 ...	11	6	11.45 ...	5	9	7.0 ...	13	0	0.0 ...	0	0
30	1.0 ...	5	9	7.30 ...	12	0	1.30 ...	6	0	8.0 ...	13	6

MAY 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.0 A.M.	5	0	9.0 A.M.	14	0	2.45 P.M.	5	6	9.30 P.M.	14	6
S 2	3.30 ...	4	6	9.45 ...	15	0	3.45 ...	5	6	10.30 ...	15	3
3	3.45 ...	3	6	10.45 ...	16	0	4.0 ...	5	3	10.45 ...	15	9
4	5.0 ...	3	0	11.30 ...	16	3	4.30 ...	6	0	11.45 ...	16	0
5	5.0 ...	2	0	11.45 ...	16	6	5.30 ...	6	0	0.0 ...	0	0
6	0.15 ...	16	0	6.30 ...	1	6	0.30 ...	16	6	7.0 ...	6	6
7	1.45 ...	15	6	7.15 ...	1	9	1.0 ...	16	9	7.0 ...	6	6
8	1.15 ...	15	0	7.15 ...	3	6	1.30 ...	15	6	7.30 ...	7	0
9	2.0 ...	13	6	8.0 ...	4	0	2.30 ...	14	6	8.0 ...	7	6
10	2.30 ...	12	9	8.15 ...	5	0	2.30 ...	13	9	8.30 ...	7	9
11	3.30 ...	12	0	8.30 ...	6	0	3.30 ...	12	9	9.30 ...	8	0
12	3.45 ...	11	6	9.45 ...	6	6	3.45 ...	12	6	10.30 ...	8	6
13	4.30 ...	10	9	10.45 ...	7	0	6.30 ...	12	6	11.45 ...	8	6
14	6.30 ...	11	0	11.45 ...	7	0	7.0 ...	12	0	0.0 ...	0	0
15	0.30 ...	8	0	7.0 ...	11	3	0.45 ...	7	0	8.0 ...	12	3
S 16	2.30 ...	5	6	8.30 ...	12	0	2.30 ...	6	6	8.45 ...	13	0
17	3.0 ...	5	0	9.30 ...	13	0	3.0 ...	6	6	9.45 ...	13	9
18	3.30 ...	3	6	10.0 ...	14	6	4.0 ...	6	6	10.0 ...	14	3
19	4.30 ...	3	0	11.0 ...	15	9	4.30 ...	6	6	11.0 ...	14	6
20	5.0 ...	1	6	11.30 ...	16	6	4.45 ...	6	6	11.45 ...	15	0
21	6.0 ...	1	0	0.0 ...	0	0	0.15 ...	17	0	6.0 ...	6	3
22	0.30 ...	15	0	6.30 ...	1	0	0.45 ...	16	9	6.45 ...	6	6
23	1.0 ...	14	6	7.0 ...	1	30	1.30 ...	16	3	7.30 ...	6	3
24	1.30 ...	13	9	8.0 ...	2	6	2.0 ...	15	3	8.30 ...	6	6
25	2.30 ...	13	3	8.30 ...	3	0	3.0 ...	14	9	9.0 ...	6	9
26	3.0 ...	12	9	9.0 ...	4	0	4.0 ...	14	3	10.0 ...	7	0
27	4.30 ...	12	3	10.30 ...	5	0	4.30 ...	13	6	10.30 ...	7	3
28	5.0 ...	12	0	11.0 ...	6	0	5.0 ...	13	6	11.30 ...	7	6
29	6.0 ...	12	6	0.0 ...	0	0	1.0 ...	6	3	7.0 ...	13	6
30	1.30 ...	6	6	7.30 ...	13	9	2.0 ...	6	6	8.45 ...	13	6
31	2.45 ...	5	6	9.0 ...	14	3	3.0 ...	6	0	9.30 ...	14	3

JUNE 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.30 A.M.	3	6	10.0 A.M.	15	3	4.0 P.M.	6	6	10.0 P.M.	14	0
2	4.30 ...	2	9	11.0 ...	16	0	5.0 ...	7	0	11.0 ...	14	3
3	5.0 ...	2	6	11.45 ...	16	2	5.30 ...	6	9	11.45 ...	14	3
4	5.30 ...	2	9	0.0 ...	0	0	0.15 ...	16	0	5.30 ...	7	0
5	0.15 ...	14	0	6.0 ...	3	3	0.30 ...	15	9	7.0 ...	7	6
6	0.30 ...	13	9	7.0 ...	4	0	1.0 ...	15	3	7.30 ...	7	6
7	1.30 ...	13	0	7.45 ...	4	0	1.45 ...	14	9	8.30 ...	7	6
8	2.0 ...	12	6	8.45 ...	4	8	2.15 ...	14	6	9.0 ...	7	9
9	3.0 ...	12	3	9.0 ...	5	9	3.30 ...	13	9	9.30 ...	8	0
10	3.30 ...	11	9	9.45 ...	6	0	3.45 ...	13	3	10.30 ...	8	0
11	4.0 ...	11	6	10.30 ...	7	0	4.30 ...	12	9	11.0 ...	8	3
12	5.0 ...	11	0	11.0 ...	8	0	5.30 ...	13	3	0.0 ...	0	0
13	0.30 ...	6	0	6.30 ...	11	6	0.30 ...	8	0	7.0 ...	13	6
14	1.0 ...	7	0	7.30 ...	13	0	1.30 ...	9	0	9.0 ...	13	6
S 15 Gale	2.0 ...	5	0	9.0 ...	14	0	2.0 ...	8	9	9.30 ...	14	0
16	2.30 ...	4	0	9.30 ...	15	0	3.30 ...	8	0	9.45 ...	14	0
17	3.45 ...	3	6	10.45 ...	15	9	4.15 ...	7	0	10.15 ...	14	3
18	4.30 ...	3	0	11.0 ...	16	6	5.0 ...	6	9	11.0 ...	14	6
19	5.0 ...	2	9	11.30 ...	16	9	5.45 ...	6	9	11.45 ...	14	9
20	6.0 ...	1	0	0.0 ...	0	0	0.15 ...	16	9	7.0 ...	5	9
21	1.0 ...	14	9	7.30 ...	2	0	1.30 ...	16	9	7.30 ...	5	6
22	1.30 ...	14	6	7.30 ...	2	3	2.0 ...	16	6	8.0 ...	6	6
23	2.0 ...	14	0	8.30 ...	4	0	2.45 ...	15	9	8.45 ...	6	9
24	3.0 ...	13	0	9.15 ...	5	0	3.15 ...	15	6	10.30 ...	7	6
25	4.0 ...	13	3	10.45 ...	6	0	5.0 ...	13	0	11.0 ...	7	9
26	5.30 ...	12	9	11.30 ...	7	0	6.30 ...	13	9	0.0 ...	0	0
27	0.30 ...	8	0	7.0 ...	12	9	1.0 ...	8	0	7.30 ...	13	0
S 28	1.30 ...	8	3	7.30 ...	11	6	1.45 ...	8	3	8.0 ...	12	9
29	2.0 ...	5	9	8.0 ...	13	6	2.30 ...	8	0	9.0 ...	13	3
30	3.0 ...	4	0	9.30 ...	14	3	3.30 ...	8	0	9.45 ...	13	9

JULY 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.45 A.M.	3	6	10.30 A.M.	14	9	3.45 P.M.	7	3	10.15 P.M.	13	6
2	4.30 ...	3	6	11.0 ...	14	10	4.30 ...	7	0	10.45 ...	13	3
3	5.0 ...	3	9	11.45 ...	14	11	5.45 ...	6	9	11.45 ...	13	0
4	6.0 ...	3	9	0.0 ...	0	0	0.15 ...	14	11	6.0 ...	7	0
5	0.15 ...	13	0	6.30 ...	4	0	0.45 ...	14	9	6.45 ...	7	0
6	0.45 ...	13	0	7.0 ...	4	0	1.0 ...	14	7	7.15 ...	7	3
7	1.15 ...	12	9	7.30 ...	4	6	1.30 ...	14	6	8.0 ...	8	0
8	2.0 ...	12	6	8.0 ...	5	0	2.15 ...	14	3	8.30 ...	8	3
9	2.30 ...	12	3	8.30 ...	5	6	2.30 ...	14	3	9.0 ...	8	6
10	3.0 ...	12	0	9.0 ...	6	0	3.30 ...	14	0	9.30 ...	8	3
11	3.30 ...	11	9	9.45 ...	8	0	4.30 ...	13	6	10.30 ...	8	3
12	5.0 ...	11	3	11.0 ...	8	6	5.45 ...	13	0	11.45 ...	8	0
13	6.30 ...	12	0	0.0 ...	0	0	1.0 ...	8	3	8.0 ...	12	6
S 14	2.0 ...	5	0	9.0 ...	13	0	2.30 ...	8	6	8.45 ...	13	0
15	3.0 ...	4	0	9.15 ...	14	0	3.0 ...	8	3	9.15 ...	13	3
16	3.30 ...	3	9	10.0 ...	15	0	4.0 ...	8	0	10.0 ...	13	6
17	4.0 ...	3	0	10.30 ...	16	3	4.30 ...	7	6	10.30 ...	14	0
18	4.30 ...	2	0	11.30 ...	16	9	5.30 ...	6	0	11.45 ...	14	6
19	6.0 ...	1	6	11.45 ...	17	0	6.15 ...	5	0	0.0 ...	0	0
20	0.15 ...	15	0	6.30 ...	1	6	1.0 ...	17	0	7.0 ...	4	6
21	1.0 ...	14	9	7.15 ...	2	0	1.30 ...	17	0	7.45 ...	4	6
22	1.45 ...	14	6	8.0 ...	3	9	2.0 ...	17	0	8.30 ...	5	0
23	3.0 ...	14	0	9.0 ...	6	0	2.30 ...	15	6	9.30 ...	5	0
24	3.30 ...	13	9	10.0 ...	6	0	3.45 ...	14	6	10.0 ...	6	0
25	4.0 ...	13	6	10.15 ...	7	6	5.0 ...	13	6	11.0 ...	8	6
26	5.30 ...	12	9	11.45 ...	9	0	6.30 ...	12	6	0.0 ...	0	0
27	0.30 ...	6	0	7.0 ...	13	6	1.0 ...	8	6	7.30 ...	12	0
S 28	1.30 ...	5	9	8.30 ...	13	9	2.0 ...	8	3	8.45 ...	12	3
29	3.15 ...	5	6	9.30 ...	14	3	3.30 ...	8	0	9.30 ...	12	6
30	3.45 ...	4	6	10.0 ...	14	6	4.0 ...	7	9	10.0 ...	12	9
31	4.0 ...	4	0	10.45 ...	14	9	4.30 ...	7	6	10.30 ...	13	0

AUGUST 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.30 A.M.	3	9	11.30 A.M.	15	3	5.45 P.M.	7	0	11.45 P.M.	13	3
2	6.0 ...	3	6	0.0 ...	0	0	0.15 ...	15	3	6.30 ...	6	0
3	0.15 ...	13	3	6.45 ...	3	0	0.45 ...	15	0	7.0 ...	5	0
4	1.0 ...	13	0	7.0 ...	2	9	1.0 ...	14	7	7.0 ...	5	6
5	1.15 ...	12	9	7.30 ...	4	0	1.30 ...	14	4	6.0 ...	5	6
6	1.30 ...	14	3	6.30 ...	4	6	1.45 ...	14	0	6.45 ...	5	0
7	2.0 ...	12	0	6.45 ...	5	0	2.30 ...	13	6	8.30 ...	5	0
8	3.0 ...	11	9	9.0 ...	6	0	3.15 ...	12	9	10.0 ...	5	6
9	4.0 ...	11	6	10.0 ...	8	0	4.30 ...	12	6	10.30 ...	6	0
10	4.30 ...	11	3	10.30 ...	8	6	5.30 ...	12	0	11.0 ...	5	0
11	5.45 ...	11	6	11.30 ...	8	0	6.0 ...	11	9	0.0 ...	0	0
S 12	0.15 ...	5	6	7.0 ...	12	6	1.0 ...	8	6	8.30 ...	11	6
13	2.30 ...	5	6	9.0 ...	13	6	3.0 ...	8	0	9.45 ...	11	9
14	3.45 ...	5	0	10.0 ...	14	9	4.0 ...	7	6	10.30 ...	13	0
15	4.30 ...	3	6	11.0 ...	16	0	4.45 ...	6	0	11.30 ...	14	0
16	4.45 ...	2	6	11.30 ...	17	0	5.0 ...	5	3	0.0 ...	0	0
17	0.15 ...	14	3	5.45 ...	2	0	0.15 ...	17	6	6.0 ...	4	0
18	0.45 ...	14	6	6.15 ...	1	6	0.45 ...	17	6	6.30 ...	3	6
19	1.0 ...	15	6	7.0 ...	1	6	1.30 ...	17	3	7.30 ...	2	6
20	1.30 ...	16	0	7.45 ...	4	0	1.45 ...	15	9	8.0 ...	3	6
21	2.0 ...	15	9	8.0 ...	5	0	2.15 ...	14	9	9.0 ...	4	6
22	2.30 ...	15	3	9.30 ...	6	0	3.30 ...	13	6	10.0 ...	5	0
23	3.45 ...	12	3	10.30 ...	7	6	4.30 ...	13	0	11.0 ...	6	0
24	5.0 ...	12	0	0.0 ...	0	0	0.30 ...	8	6	6.0 ...	11	0
25	0.15 ...	7	0	6.30 ...	11	6	0.45 ...	8	9	7.0 ...	11	0
S 26	1.0 ...	7	3	7.0 ...	12	0	1.0 ...	8	9	8.0 ...	11	0
27	1.30 ...	6	0	8.30 ...	13	6	2.0 ...	9	0	8.30 ...	11	3
28	2.0 ...	5	6	9 30 ...	14	0	3.0 ...	8	0	9.30 ...	12	0
29	3.0 ...	5	0	10.0 ...	14	6	4.0 ...	7	9	10.0 ...	12	9
30	4.0 ...	4	0	11.0 ...	15	0	4.15 ...	7	0	11.0 ...	13	9
31	4.15 ...	4	0	11.30 ...	15	3	5.30 ...	5	0	11.30 ...	14	0

SEPTEMBER 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.45 A.M.	4	6	0.15 A.M.	15	6	6.30 P.M.	5	0	0.0 P.M.	0	0
2	0.30 ...	14	9	6.30 ...	4	9	0.45 ...	15	6	4.30 ...	3	6
3	0.45 ...	15	3	7.0 ...	5	0	1.0 ...	15	3	5.0 ...	4	0
4	1.15 ...	14	9	6.0 ...	5	0	1.30 ...	14	9	6.30 ...	4	6
5	2.0 ...	14	3	7.0 ...	6	6	2.30 ...	14	3	8.0 ...	5	0
6	2.30 ...	13	9	8.30 ...	6	6	3.0 ...	13	0	9.0 ...	6	0
7	3.0 ...	12	9	9.0 ...	8	6	3.30 ...	12	0	10.0 ...	6	0
8	4.0 ...	12	3	9.45 ...	9	0	4.0 ...	11	0	10.15 ...	6	6
9	4.30 ...	11	9	10.30 ...	9	6	5.0 ...	11	3	11.0 ...	6	0
10	5.30 ...	12	0	11.45 ...	9	0	7.0 ...	11	9	0.0 ...	0	0
S 11	0.15 ...	6	0	8.0 ...	13	6	1.0 ...	7	0	9.0 ...	12	6
12	2.30 ...	4	0	9.30 ...	14	9	3.0 ...	5	0	9.30 ...	13	6
13	3.0 ...	3	6	10.0 ...	15	9	4.0 ...	4	6	10.0 ...	14	9
14	4.30 ...	3	0	11.0 ...	16	9	4.30 ...	3	0	11.0 ...	15	9
15	5.0 ...	2	0	11.30 ...	17	0	5.30 ...	2	6	0.0 ...	0	0
16	0.15 ...	16	9	6.0 ...	3	0	0.30 ...	17	3	6.30 ...	2	0
17	0.30 ...	17	0	6.30 ...	3	6	1.0 ...	16	6	7.0 ...	1	6
18	1.0 ...	16	9	7.0 ...	4	0	1.15 ...	15	3	7.30 ...	2	0
19	1.30 ...	16	0	8.0 ...	6	0	1.45 ...	14	0	10.0 ...	4	0
20	2.30 ...	14	0	10.0 ...	8	0	3.0 ...	12	6	10.30 ...	5	0
21	3.0 ...	13	0	10.30 ...	9	0	3.30 ...	11	9	11.0 ...	6	0
22	5.0 ...	12	6	11.30	8	0	5.30 ...	11	9	11.45 ...	6	6
23	6.0 ...	12	0	0.0 ...	0	0	0.15 ...	8	6	8.0 ...	11	0
24	0.30 ...	6	0	7.0 ...	12	3	1.0 ...	8	6	8.30 ...	11	3
S 25	1.0 ...	6	3	8.0 ...	12	6	1.30 ...	8	0	8.45 ...	12	0
26	1.30 ...	5	6	9.0 ...	12	9	1.45 ...	7	6	9.0 ...	12	9
27	2.0 ...	5	0	9.30 ...	13	9	4.0 ...	6	0	10.0 ...	13	6
28	4.0 ...	5	9	10.0 ...	14	9	4.30 ...	5	0	10.30 ...	14	0
29	5.0 ...	4	9	10.45 ...	15	0	5.15 ...	4	6	11.15 ...	14	3
30	5.30 ...	4	0	11.30 ...	15	0	5.30 ...	4	0	0.0 ...	0	0

OCTOBER 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.15 A.M.	14	3	5.45 A.M.	5	6	0.15 P.M.	15	0	6.0 P.M.	3	0
2	0.30 ...	14	9	6.30 ...	5	0	0.30 ...	15	0	6.30 ...	4	0
3	1.0 ...	14	9	7.0 ...	6	0	1.0 ...	14	6	7.0 ...	4	6
4	1.15 ...	14	6	7.30 ...	6	6	1.30 ...	14	0	7.30 ...	4	0
5	1.45 ...	14	9	7.45 ...	7	0	2.0 ...	13	3	8.30 ...	4	3
6	2.30 ...	13	9	8.30 ...	8	0	2.30 ...	12	3	9.30 ...	4	6
7	2.45 ...	13	0	10.0 ...	9	0	4.0 ...	11	0	10.0 ...	5	0
8	3.0 ...	12	0	10.30 ...	8	6	4.30 ...	10	9	11.0 ...	5	3
9	4.30 ...	12	9	11.30 ...	7	0	6.30 ...	11	3	11.45 ...	4	9
S 10	0.0 ...	0	0	7.30 ...	13	3	1.30 ...	6	0	9.0 ...	12	3
11	3.0 ...	3	9	9.30 ...	15	3	3.30 ...	3	6	9.15 ...	13	6
12	3.30 ...	3	9	9.45 ...	15	3	3.45 ...	3	0	9.45 ...	15	3
13	4.30 ...	4	0	10.15 ...	15	9	4.30 ...	1	6	11.0 ...	16	3
14	5.30 ...	3	10	11.15 ...	15	9	5.30 ...	1	0	11.30 ...	16	6
15	5.45 ...	3	9	11.45 ...	15	3	6.0 ...	1	0	0.0 ...	0	0
16	0.15 ...	16	9	6.0 ...	4	3	0.15 ...	15	0	7.0 ...	1	0
17	1.0 ...	16	4	7.0 ...	5	6	1.0 ...	14	6	7.15 ...	2	0
18	1.15 ...	15	6	7.30 ...	6	0	1.30 ...	13	6	8.0 ...	4	0
19	2.0 ...	14	6	8.30 ...	8	0	2.30 ...	12	3	9.0 ...	5	0
20	3.0 ...	13	0	9.0 ...	6	0	3.0 ...	12	0	9.30 ...	5	3
21	3.30 ...	12	6	10.0 ...	7	0	5.0 ...	12	6	11.0 ...	7	3
22	5.30 ...	12	6	11.30 ...	9	0	6.0 ...	10	0	11.45 ...	7	6
23	6.0 ...	12	3	0.0 ...	0	0	0.15 ...	8	0	7.0 ...	11	0
24	0.15 ...	7	6	7.15 ...	12	6	0.30 ...	6	6	7.30 ...	11	6
S 25	1.30 ...	7	6	8.0 ...	13	0	1.30 ...	6	0	8.30 ...	12	0
26	2.15 ...	7	6	8.30 ...	13	6	2.15 ...	5	0	9.30 ...	13	6
27	3.30 ...	6	6	9.30 ...	13	9	3.30 ...	4	6	10.0 ...	14	6
28	3.45 ...	6	0	10.0 ...	13	9	4.0 ...	4	6	10.30 ...	15	0
29	4.30 ...	6	0	11.0 ...	14	3	5.0 ...	3	0	11.45 ...	15	3
30	5.30 ...	4	9	11.45 ...	14	6	5.45 ...	2	0	0.0 ...	0	0
31	0.15 ...	15	9	6.0 ...	6	0	0.15 ...	14	7	6.30 ...	1	6

NOVEMBER 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.45 A.M.	15	9	6.30 A.M.	7	0	0.30 P.M.	14	3	4.30 P.M.	3	0
2	1.0 ...	15	9	6.45 ...	6	0	1.30 ...	13	6	6.0 ...	3	6
3	1.30 ...	15	6	7.30 ...	6	9	2.15 ...	13	3	7.45 ...	4	6
4	2.30 ...	14	6	9.0 ...	8	6	3.30 ...	12	3	9.15 ...	5	0
5	3.45 ...	13	6	9.45 ...	8	6	3.45 ...	11	6	10.0 ...	5	6
6	4.15 ...	13	3	10.15 ...	9	6	4.15 ...	11	0	11.45 ...	7	0
7	5.30 ...	13	6	0.0 ...	0	0	1.0 ...	6	6	7.0 ...	11	6
8	1.0 ...	6	6	7.30 ...	13	9	1.30 ...	5	3	8.0 ...	13	3
9	2.0 ...	7	0	8.0 ...	14	3	2.15 ...	4	0	9.30 ...	14	9
10	2.30 ...	6	0	10.0 ...	14	6	4.0 ...	2	0	10.0 ...	15	6
11	2.45 ...	6	6	10.15 ...	15	3	4.15 ...	2	0	10.30 ...	16	9
12	3.30 ...	6	3	10.45 ...	15	6	4.30 ...	1	6	11.0 ...	17	3
13	4.30 ...	6	9	11.0 ...	15	0	5.0 ...	1	0	11.45 ...	16	9
14	5.30 ...	7	0	0.0 ...	0	0	0.30 ...	14	9	5.45 ...	1	0
15	0.45 ...	15	6	6.0 ...	7	0	1.0 ...	14	3	7.0 ...	3	0
16	1.0 ...	16	0	7.15 ...	8	0	1.15 ...	13	9	7.45 ...	4	6
17	1.45 ...	15	0	8.0 ...	8	6	2.0 ...	13	0	8.0 ...	5	0
18	2.0 ...	14	3	8.15 ...	9	0	2.15 ...	12	3	10.0 ...	6	3
19	2.30 ...	13	3	10.0 ...	9	0	2.30 ...	11	3	10.30 ...	6	6
20	2.45 ...	12	3	11.0 ...	8	6	3.0 ...	10	3	11.0 ...	6	9
21	4.0 ...	12	6	11.30 ...	8	0	5.30 ...	10	6	11.30 ...	7	0
22	6.0 ...	12	9	0.0 ...	0	0	0.15 ...	7	0	6.30 ...	11	6
23	0.30 ...	7	6	7.0 ...	13	0	0.45 ...	0	6	8.0 ...	12	0
24	1.0 ...	7	0	8.30 ...	13	3	2.0 ...	5	0	8.30 ...	13	9
25	2.0 ...	6	9	9.0 ...	13	3	2.30 ...	4	6	10.0 ...	14	9
26	4.0 ...	6	9	10.15 ...	13	9	4.15 ...	4	0	10.30 ...	15	6
27	4.15 ...	6	6	10.30 ...	14	0	4.30 ...	2	0	11.0 ...	16	0
28	5.0 ...	7	0	11.30 ...	14	0	5.30 ...	2	0	11.45 ...	16	3
29	5.30 ...	7	0	0.0 ...	0	0	0.15 ...	14	0	6.0 ...	2	0
30	0.30 ...	16	6	6.30 ...	6	0	0.45 ...	14	0	6.30 ...	2	6

DECEMBER 1837.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.0 A.M.	16	3	7.0 A.M.	7	6	1.0 P.M.	13	6	7.30 P.M.	3	6
2	1.30 ...	15	9	8.0 ...	7	9	1.30 ...	12	9	8.30 ...	4	0
3	2.0 ...	5	0	8.30 ...	8	0	2.0 ...	12	0	9.0 ...	4	6
4	2.30 ...	14	6	9.0 ...	7	0	2.30 ...	11	6	9.30 ...	5	0
5	3.0 ...	14	0	9.30 ...	6	6	4.0 ...	12	6	11.0 ...	7	0
6	4.30 ...	13	6	0.0 ...	0	0	0.30 ...	5	0	6.0 ...	12	6
7	0.30 ...	7	9	6.30 ...	13	6	0.45 ...	4	6	7.0 ...	13	3
8	1.0 ...	8	0	7.0 ...	13	9	1.0 ...	4	0	8.0 ...	14	3
9	2.0 ...	7	0	8.30 ...	13	6	2.30 ...	3	0	9.30 ...	15	3
10	2.30 ...	7	0	9.30 ...	13	6	2.45 ...	3	0	10.30 ...	16	0
11	3.0 ...	6	6	10.30 ...	14	0	3.30 ...	3	3	11.0 ...	16	6
12	4.0 ...	6	0	11.30 ...	14	0	5.0 ...	3	0	11.30 ...	16	3
13	6.0 ...	6	0	11.45 ...	14	0	5.30 ...	2	6	0.0 ...	0	0
14	0.15 ...	16	0	6.30 ...	6	6	6.30 ...	13	6	6.0 ...	2	6
15	1.0 ...	16	0	7.0 ...	6	9	1.30 ...	13	3	7.0 ...	4	0
16	1.30 ...	15	6	7.30 ...	7	0	2.0 ...	12	6	8.0 ...	5	0
17	2.0 ...	15	0	8.0 ...	7	6	2.15 ...	12	3	9.30 ...	6	0
18	2.30 ...	14	6	8.30 ...	8	0	3.0 ...	12	0	10.0 ...	6	6
19	3.0 ...	14	3	10.30 ...	8	3	4.0 ...	11	9	11.0 ...	6	9
20	4.0 ...	14	0	11.0 ...	8	6	4.15 ...	11	6	11.0 ...	6	9
21	4.30 ...	13	0	11.30 ...	7	0	5.0 ...	11	3	11.30 ...	7	6
22	5.0 ...	13	0	11.45 ...	6	0	6.0 ...	12	3	0.0 ...	0	0
23	0.30 ...	7	6	6.30 ...	13	0	1.0 ...	4	9	8.0 ...	13	6
24	2.0 ...	8	6	8.30 ...	12	9	2.30 ...	4	0	9.0 ...	14	3
25	2.30 ...	7	6	9.15 ...	13	0	3.0 ...	4	0	9.30 ...	15	0
26	3.30 ...	7	0	9.30 ...	13	3	3.30 ...	3	0	10.30 ...	16	0
27	4.0 ...	6	9	10.30 ...	13	6	5.45 ...	1	6	11.45 ...	17	0
28	6.30 ...	6	6	0.0 ...	0	0	0.30 ...	14	9	6.0 ...	1	3
29	7.0 ...	17	6	7.0 ...	6	0	1.15 ...	15	0	6.0 ...	1	3
30	1.0 ...	17	6	7.0 ...	6	0	1.30 ...	15	0	5.0 ...	1	6
31	1.15 ...	17	6	8.0 ...	6	0	2.0 ...	15	0	5.30 ...	1	6

JANUARY 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.	'		H. M.			H. M.			H. M.		
1	2.30 A.M.	17	0	8.30 A.M.	6	0	2.15 P.M.	14	6	6.0 P.M.	2	0
2	3.0 ...	16	6	9.0 ...	5	9	3.0 ...	14	0	7.30 ...	3	0
3	3.30 ...	15	0	9.30 ...	7	0	4.30 ...	13	3	10.0 ...	5	0
4	5.0 ...	14	6	10.30 ...	5	0	5.30 ...	12	9	12.0 ...	8	0
5	5.30 ...	13	9	11.45 ...	5	0	7.30 ...	13	0	0.0 ...	0	0
S 6	1.15 ...	8	3	7.30 ...	12	6	1.30 ...	4	0	7.30 ...	14	0
7	2.30 ...	8	0	8.0 ...	12	3	3.0 ...	3	6	9.0 ...	14	6
8	3.30 ...	8	3	9.30 ...	12	6	4.0 ...	3	6	10.0 ...	15	0
9	4.0 ...	8	0	10.30 ...	12	9	5.0 ...	3	6	11.0 ...	15	9
10	5.0 ...	7	9	11.0 ...	13	0	6.0 ...	3	0	11.45 ...	16	0
11	6.0 ...	6	0	0.0 ...	0	0	0.15 ...	13	4	5.0 ...	4	0
12	0.30 ...	16	3	6.0 ...	6	0	0.45 ...	13	3	6.0 ...	4	3
13	1.0 ...	16	3	7.0 ...	7	0	1.15 ...	13	6	6.45 ...	4	9
14	1.15 ...	16	3	7.15 ...	6	6	1.30 ...	13	3	7.30 ...	5	0
15	1.45 ...	15	9	8.0 ...	6	0	1.45 ...	13	3	8.0 ...	5	6
16	2.0 ...	15	3	8.30 ...	6	0	2.15 ...	12	9	9.0 ...	6	6
17	2 15 ...	14	3	9.0 ...	5	9	2.30 ...	12	0	9.30 ...	6	9
18	2.30 ...	13	9	9.45 ...	5	6	3.30 ...	11	9	9.45 ...	7	0
19	3.30 ...	13	3	10.0 ...	5	0	5.0 ...	11	6	10.30 ...	7	0
20	5.0 ...	12	6	11.30 ...	5	0	6.0 ...	12	0	11.30 ...	7	3
21	7.0 ...	11	3	0.0 ...	0	0	0.15 ...	4	6	7.0 ...	12	6
S 22	0.30 ...	7	9	7.30 ...	11	6	1.30 ...	4	3	8.45 ...	13	6
23	2.0 ...	8	3	9.0 ...	12	3	2.30 ...	3	9	9.30 ...	14	6
24	3.30 ...	8	0	9.45 ...	13	0	3.45 ...	3	0	10.30 ...	15	9
25	4.30 ...	7	9	10.30 ...	14	3	4.0 ...	3	0	11.30 ...	16	6
26	4.30 ...	6	0	11.30 ...	15	0	4.30 ...	2	6	0.0 ...	0	0
27	0.15 ...	17	9	5.30 ...	5	9	0.15 ...	15	6	6.0 ...	2	0
28	0.45 ...	17	9	7.0 ...	4	3	1.0 ...	16	0	7.0 ...	2	0
29	1.15 ...	17	6	7.30 ...	5	0	2.0 ...	15	9	8.0 ...	4	0
30	2.30 ...	16	6	8.30 ...	3	0	2.45 ...	15	6	8.45 ...	4	6
31	2.45 ...	16	3	9.0 ...	4	0	3.0 ...	15	0	9.0 ...	5	6

FEBRUARY 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.0 A.M.	15	9	9.30 A.M.	4	0	4.0 P.M.	14	3	10.30 P.M.	6	9
2	4.30 ...	14	6	10.45 ...	4	0	5.0 ...	12	9	11.0 ...	7	0
3	5.30 ...	13	0	11.45 ...	5	0	0.0 ...	0	0	6.0 ...	12	6
4	0.15 ...	6	0	6.30 ...	12	0	0.30 ...	4	6	7.0 ...	13	0
S 5	1.0 ...	7	0	7.15 ...	11	6	1.30 ...	5	3	8.30 ...	13	3
6	2.30 ...	6	9	8.45 ...	11	6	3.0 ...	4	6	9.30 ...	14	0
7	3.0 ...	6	9	9.30 ...	12	3	4.0 ...	3	9	10.15 ...	15	0
8	4.15 ...	6	3	10.30 ...	13	0	4.30 ...	4	0	10.45 ...	15	9
9	5.0 ...	6	3	11.0 ...	13	6	5.45 ...	4	0	11.45 ...	16	3
10	6.0 ...	6	0	0.0 ...	0	0	0.15 ...	14	0	5.30 ...	4	0
11	0.15 ...	16	0	6.0 ...	5	9	0.45 ...	14	0	6.45 ...	5	6
12	1.0 ...	15	9	7.0 ...	5	0	1.15 ...	14	0	7.0 ...	4	6
13	1.15 ...	15	6	7.30 ...	4	6	1.30 ...	13	9	8.0 ...	5	6
14	1.45 ...	14	9	8.30 ...	4	6	2.0 ...	13	6	8.30 ...	6	0
15	2.15 ...	14	3	9.0 ...	4	0	2.30 ...	13	0	9.0 ...	6	6
16	2.45 ...	13	3	9.30 ...	3	3	3.0 ...	12	6	9.30 ...	[illegible]	0
17	3.15 ...	12	9	10.0 ...	4	9	3.30 ...	11	6	10.30 ...	7	3
18	3.30 ...	11	9	11.0 ...	5	6	4.0 ...	12	0	11.0 ...	7	0
19	4.30 ...	11	6	11.15 ...	5	9	6.0 ...	12	3	11.45 ...	7	6
S 20	7.15 ...	11	0	11.45 ...	5	0	8.0 ...	13	3	0.0 ...	0	0
21	1.0 ...	7	3	8.15 ...	11	3	1.30 ...	4	0	9.0 ...	14	0
22	2.30 ...	7	0	9.30 ...	12	6	3.0 ...	3	0	10.0 ...	15	3
23	3.45 ...	6	6	10.15 ...	14	3	4.0 ...	2	6	11.30 ...	17	0
24	5.0 ...	5	0	11.45 ...	15	6	5.15 ...	1	6	11.45 ...	17	9
25	5.30 ...	3	0	0.0 ...	0	0	0.15 ...	16	6	6.0 ...	1	0
26	0.15 ...	17	9	6.30 ...	2	6	0.30 ...	17	0	7.0 ...	2	0
27	0.45 ...	17	9	7.30 ...	1	6	1.0 ...	16	9	7.30 ...	4	0
28	1.30 ...	17	6	8.0 ...	1	6	2.0 ...	16	3	8.0 ...	5	0

MARCH 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.15 A.M.	16	3	8.45 A.M.	2	3	2.45 P.M.	15	0	9.0 P.M.	6	0
2	2.30 ...	15	0	9.30 ...	3	3	3.0 ...	13	6	10.0 ...	6	9
3	3.0 ...	14	0	10.30 ...	4	6	3.45 ...	12	6	11.0 ...	7	0
4	4.30 ...	12	0	11.30 ...	6	6	5.0 ...	12	0	11.45 ...	7	6
5	5.45 ...	11	6	0.0 ...	0	0	0.30 ...	6	3	5.30 ...	12	0
6	1.30 ...	7	6	6.0 ...	11	0	2.0 ...	5	0	8.30 ...	13	0
S 7	2.45 ...	7	0	9.0 ...	11	0	3.0 ...	4	9	9.30 ...	13	9
8	3.15 ...	7	0	9.45 ...	12	0	3.30 ...	4	6	10.0 ...	14	6
9	3.30 ...	6	6	10.30 ...	13	0	3.45 ...	4	0	11.0 ...	15	0
10	4.30 ...	4	9	11.15 ...	13	9	4.45 ...	4	3	11.30 ...	15	6
11	5.0 ...	4	6	11.45 ...	14	3	5.30 ...	4	6	0.0 ...	0	0
12	0.15 ...	15	9	6.0 ...	4	6	0.30 ...	14	6	6.0 ...	4	3
13	0.30 ...	15	9	6.30 ...	3	9	0.45 ...	14	9	7.0 ...	4	6
14	1.15 ...	15	9	7.30 ...	3	3	1.30 ...	15	0	6.30 ...	5	0
15	1.30 ...	15	6	7.45 ...	3	3	1.45 ...	14	9	8.0 ...	6	9
16	2.0 ...	14	9	8.30 ...	3	6	2.15 ...	14	6	8.30 ...	6	9
17	2.30 ...	14	0	9.0 ...	4	0	2.30 ...	13	9	8.45 ...	7	0
18	1.30 ...	13	6	9.15 ...	4	6	3.30 ...	13	6	9.0 ...	7	6
19	3.0 ...	12	3	9.30 ...	5	6	4.0 ...	12	9	10.30 ...	8	0
20	5.0 ...	11	6	9.30 ...	6	6	6.0 ...	12	9	11.30 ...	8	6
21	7.0 ...	11	3	11.30 ...	6	0	7.30 ...	13	6	0.0 ...	0	0
S 22	0.30 ...	8	0	8.0 ...	11	9	1.0 ...	5	9	9.0 ...	14	6
23	1.30 ...	7	9	9.30 ...	13	3	2.30 ...	4	0	10.0 ...	15	9
24	3.0 ...	6	0	10.0 ...	14	6	3.45 ...	3	0	10.30 ...	16	6
25	4.0 ...	4	0	10.45 ...	16	0	4.30 ...	1	9	11.0 ...	17	6
26	5.0 ...	2	0	11.30 ...	17	0	5.30 ...	3	0	11.45 ...	17	9
27	5.30 ...	1	0	0.0 ...	0	0	0.15 ...	17	6	6.30 ...	2	3
28	0.15 ...	17	6	7.0 ...	1	0	0.30 ...	17	6	7.0 ...	4	0
29	1.0 ...	16	10	8.0 ...	1	0	2.0 ...	16	9	8.0 ...	4	6
30	2.0 ...	16	0	8.30 ...	2	2	2.30 ...	15	6	8.45 ...	6	0
31	2.30 ...	14	6	9.0 ...	3	0	3.0 ...	14	0	9.30 ...	6	9

APRIL 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.0 A.M.	12	9	10.0 A.M.	5	0	3.0 P.M.	13	0	10.0 P.M.	7	0
2	3.30 ...	12	6	10.30 ...	6	0	5.0 ...	12	6	11.45 ...	7	0
3	5.45 ...	11	6	0.0 ...	0	0	0.15 ...	7	9	6.30 ...	12	0
4	0.30 ...	7	0	7.0 ...	11	0	1.30 ...	7	0	7.15 ...	12	9
S 5	1.45 ...	7	0	7.30 ...	11	6	2.0 ...	6	6	8.30 ...	14	0
6	2.30 ...	6	0	8.30 ...	12	6	2.45 ...	6	6	9.30 ...	14	6
7	2.30 ...	5	6	9.30 ...	13	3	4.0 ...	5	6	10.30 ...	15	0
8	4.30 ...	5	0	11.0 ...	14	3	4.30 ...	5	0	11.0 ...	15	2
9	5.0 ...	4	6	11.30 ...	15	0	5.15 ...	4	6	11.45 ...	15	3
10	5.30 ...	3	9	0.0 ...	0	0	0.15 ...	15	6	5.30 ...	5	6
11	0.15 ...	15	6	6.0 ...	3	6	0.30 ...	15	6	6.15 ...	6	0
12	0.30 ...	15	6	6.30 ...	3	0	0.45 ...	15	6	6.30 ...	6	3
13	1.0 ...	15	0	7.0 ...	2	9	1.15 ...	15	3	7.0 ...	6	6
14	1.30 ...	14	0	7.30 ...	3	0	1.30 ...	14	9	9.0 ...	7	6
15	2.30 ...	14	0	9.15 ...	3	0	3.9 ...	13	9	9.30 ...	7	9
16	3.0 ...	13	6	9.30 ...	3	6	3.30 ...	13	6	10.0 ...	7	6
17	4.0 ...	11	6	10.30 ...	5	0	4.30 ...	12	9	10.45 ...	7	3
18	4.15 ...	11	0	11 0 ...	5	6	5.0 ...	12	6	11.15 ...	7	9
19	5.30 ...	11	3	11.30 ...	6	0	6.30 ...	12	9	11.45 ...	6	9
S 20	7.0 ...	11	9	0 0 ...	0	0	0.30 ...	5	0	8.0 ...	14	0
21	1.30 ...	5	0	8.15 ...	13	3	2.15 ...	4	6	9.0 ...	15	3
22	2.30 ...	4	0	9.30 ...	14	9	3.30 ...	4	0	9.30 ...	16	0
23	3.30 ...	2	6	10.0 ...	16	3	5.0 ...	4	0	11.0 ...	16	6
24	5.30 ...	1	6	11.30 ...	17	6	5.30 ...	4	6	11.45 ...	16	6
25	5.45 ...	1	0	11.45 ...	17	6	6.0 ...	5	0	0.0 ...	0	0
26	0.30 ...	16	3	6.30 ...	1	0	1.0 ...	17	0	6.30 ...	5	6
27	1.0 ...	15	6	7.0 ...	2	0	1.30 ...	16	6	7.30 ...	6	6
28	2.0 ...	14	8	8.0 ...	3	0	2.30 ...	15	3	8.0 ...	7	6
29	2.30 ...	13	0	8.30 ...	4	0	2.45 ...	14	0	9.0 ...	7	6
30	3.0 ...	12	0	9.0 ...	5	0	3.30 ...	13	6	9.30 ...	8	3

MAY 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.45 A.M.	11	9	10.0 A.M.	6	9	4.0 P.M.	12	0	10.30 P.M.	8	6
2	4.30 ...	11	6	11.0 ...	6	9	6.0 ...	13	0	11.30 ...	7	6
3	6.0 ...	10	6	11.45 ...	7	0	6.30 ...	12	6	0.0 ...	0	0
4	1.30 ...	7	6	7.0 ...	11	0	1.30 ...	7	0	8.0 ...	13	0
S 5	1.45 ...	6	0	8.30 ...	12	0	2.0 ...	7	6	9.15 ...	13	0
6	3.15 ...	5	0	9.30 ...	13	3	3.0 ...	6	0	10.0 ...	13	6
7	3.45 ...	4	0	9.45 ...	13	9	3.45 ...	6	0	10.15 ...	13	6
8	4.15 ...	3	6	10.45 ...	14	6	4.30 ...	6	0	10.30 ...	14	0
9	5.0 ...	3	0	11.0 ...	15	0	5.30 ...	6	0	11 45 ...	14	3
10	5.30 ...	2	0	11.45 ...	15	6	6.0 ...	6	6	0.0 ...	0	0
11	0.15 ...	14	0	6.0 ...	1	6	6.15 ...	15	6	6.30 ...	7	0
12	0.30 ...	13	9	6.45 ...	1	6	0.45 ...	15	6	7.30 ...	6	9
13	1.0 ...	13	6	7.45 ...	2	3	1.30 ...	15	0	8.0 ...	7	0
14	1.30 ...	13	3	8.15 ...	3	0	2.0 ...	14	3	8.30 ...	7	6
15	2.30 ...	12	3	8.30 ...	4	0	2.30 ...	13	9	10.0 ...	7	0
16	3.0 ...	11	9	10.30 ...	5	0	4.0 ...	13	3	10.0 ...	8	0
17	4.30 ...	11	6	10.45 ...	5	0	4.30 ...	12	9	11.0 ...	7	6
18	5.30 ...	11	9	11,45 ...	6	8	6 30 ...	13	0	11.30 ...	7	0
19	7.15 ...	12	6	0.0 ...	0	0	1.0 ...	6	0	8.0 ...	13	9
S 20	1.0 ...	5	0	8.30 ...	13	9	1.30 ...	6	0	9.0 ...	14	3
21	2.0 ...	4	6	9.0 ...	15	0	2.30 ...	5	6	10.0 ...	14	3
22	4.0 ...	1	0	10.30 ...	16	0	4.0 ...	6	0	10.30 ...	14	6
23	4.30 ...	1	0	11.0 ...	16	6	5.0 ...	5	9	11.0 ...	14	9
24	6.0 ...	1	0	11.30 ...	16	9	5.30 ...	5	9	0.0 ...	0	0
25	0.15 ...	14	6	5.45 ...	1	0	0.15 ...	16	6	6.0 ...	5	9
26	0.30 ...	14	3	6.30 ...	1	9	0.45 ...	15	9	7.30 ...	6	6
27	1.0 ...	13	9	7.45 ...	2	6	1.0 ...	15	0	8.0 ...	6	9
28	1.30 ...	13	6	8.30 ...	3	9	2.0 ...	14	0	8.0 ...	7	0
29	2.30 ...	12	6	8.30 ...	5	0	2 30 ...	13	6	9.0 ...	7	6
30	3.0 ...	12	0	9.0 ...	5	9	3.15 ...	12	6	10.0 ...	6	9
31	3.45 ...	11	9	10.30 ...	7	6	5.0 ...	12	0	10.30 ...	8	0

JUNE 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.0 A.M.	11	6	11.0 A.M.	7	9	6.0 P.M.	13	3	11.30 P.M.	7	6
2	5.45 ...	11	6	11.30 ...	8	0	6.30 ...	13	6	0.0 ...	0	0
3	0.30 ...	7	0	8.0 ...	12	9	1.0 ...	8	6	8.0 ...	13	6
4	1.30 ...	6	0	8.15 ...	13	6	1.30 ...	8	0	9.45 ...	13	3
S 5	2.30 ...	5	0	9.45 ...	14	0	2.0 ...	7	0	10.15 ...	13	6
6	4.0 ...	4	0	10.15 ...	14	6	4.15	7	6	11.0 ...	13	6
7	3.0 ...	2	6	11 0 ...	15	3	4.30 ...	7	0	11.30 ...	13	6
8	4.30 ...	2	6	11.45 ...	16	0	5.45 ...	7	0	11.45 ...	13	9
9	6.0 ...	2	6	0.0 ...	0	0	0.15 ...	16	3	6.30 ...	7	0
10	0.30 ...	13	9	6.30 ...	2	3	1.0 ...	16	3	7.0 ...	7	0
11	1.0 ...	13	9	7.0 ...	2	6	1.30 ...	16	3	8.30 ...	7	3
12	2.0 ...	13	6	8.45 ...	3	6	2.30 ...	16	0	8 30 ...	7	6
13	2.30 ...	13	3	8.30 ...	5	0	3.0 ...	15	9	9.0 ...	7	9
14	3.15 ...	12	9	9.30 ...	5	6	3.45 ...	15	6	10.0 ...	8	3
15	4.0 ...	12	6	10.30 ...	5	6	5.0 ...	14	9	11.0 ...	7	9
16	5.0 ...	12	6	11.0 ...	7	0	6.0 ...	12	6	11.45 ...	5	6
17	7.0 ...	14	0	0.0 ...	0	0	0.30 ...	7	9	7.30 ...	13	6
18	0.30 ...	4	6	8.0 ...	14	6	1.0 ...	7	0	8.30 ...	14	0
S 19	2.0 ...	3	0	9.0 ...	14	9	2.0 ...	7	3	9.30 ...	14	0
20	3.30 ...	2	6	10.0 ...	15	3	3.30 ...	7	0	10.0 ...	14	0
21	4.0 ...	2	0	10.30 ...	16	0	4.30 ...	7	0	11.0 ...	14	3
22	5.0 ...	1	6	11.30 ...	16	3	5.30 ...	6	3	11.30 ...	14	3
23	5.30 ...	2	6	0.0 ...	0	0	0.15 ...	16	3	5.30 ...	6	3
24	0.30 ...	12	9	5.45 ...	3	6	0.30 ...	15	6	6 30 ...	6	6
25	1.0 ...	13	6	6.30 ...	4	6	1.0 ...	15	6	7.15 ...	7	6
26	1.30 ...	13	0	7.30 ...	4	9	2.0 ...	15	0	8.0 ...	7	6
27	2.0 ...	12	6	8.0 ...	5	0	2.30 ...	13	6	9.0 ...	8	0
28	2.30 ...	12	0	9.30 ...	6	0	3.0 ...	13	0	9.30 ...	7	3
29	2.30 ...	12	0	10.0 ...	6	9	3.30 ...	13	0	10.15 ...	7	6
30	3.30 ...	11	9	10.30 ...	7	0	5.30 ...	12	9	10.30 ...	7	0

JULY 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.45 A.M.	11	6	11.0 A.M.	7	6	6.0 P.M.	12	6	11.15 P.M.	6	9
2	6.30 ...	12	0	11.30 ...	7	6	7.0 ...	11	9	0.0 ...	0	0
3	0.30 ...	6	6	8.0 ...	12	9	1.0 ...	9	3	8.0 ...	12	0
S 4	1.30 ...	5	0	8.30 ...	13	3	2.0 ...	9	0	8.45 ...	12	6
5	2.30 ...	3	9	9.0 ...	14	3	3.0 ...	8	6	10.0 ...	12	9
6	3.30 ...	4	0	10.30 ...	15	3	3.45 ...	7	6	10.45 ...	13	0
7	4.30 ...	3	6	11.45 ...	16	0	5.30 ...	7	0	11.45 ...	13	6
8	6.0 ...	2	0	0.0 ...	0	0	0.30 ...	16	3	6.30 ...	6	6
9	0.30 ...	13	6	6.30 ...	2	0	1.0 ...	16	6	7.0 ...	5	0
10	1.0 ...	14	0	7.0 ...	2	0	1.15 ...	16	3	7.15 ...	5	0
11	1.30 ...	14	0	7.30 ...	2	6	1.30 ...	15	9	7.30 ...	4	6
12	1.30 ...	13	9	8.0 ...	3	6	2.0 ...	15	6	8.15 ...	3	9
13	2.30 ...	13	6	8.30 ...	5	0	3.0 ...	15	0	9.0 ...	4	6
14	3.0 ...	13	0	9.30 ...	6	0	3.30 ...	14	9	10.0 ...	5	0
15	4.0 ...	12	9	10.45 ...	7	0	5.0 ...	13	6	11.45 ...	6	0
16	5.30 ...	12	6	0.0 ...	0	0	0.15 ...	8	6	6.30 ...	12	6
17	0.30 ...	6	6	7.0 ...	12	3	1.0 ...	8	6	7.30 ...	12	6
S 18	1.30 ...	5	9	8.0 ...	13	9	2 0 ...	8	0	9.0 ...	12	9
19	3.30 ...	4	0	9.15 ...	14	3	3.45 ...	7	6	9.30 ...	12	9
20	4.0 ...	3	9	10.0 ...	14	9	4.30 ...	6	9	10.45 ...	13	0
21	5.0 ...	3	0	11.0 ...	15	3	5.45 ...	6	6	11.30 ...	13	6
22	6.0 ...	3	6	0.0 ...	0	0	0.30 ...	15	6	6.30 ...	6	0
23	0.15 ...	13	6	6.30 ...	3	6	1.0 ...	15	9	6.45 ...	6	0
24	1.0 ...	13	6	6.45 ...	3	6	1.30 ...	15	6	7.0 ...	6	0
25	1.30 ...	13	3	7.15 ...	4	9	2.0 ...	15	3	7.45 ...	5	6
26	2.0 ...	13	0	8.0 ...	5	0	2.15 ...	14	9	8.0 ...	5	3
27	2.45 ...	12	9	8.15 ...	6	0	3.0 ...	14	0	9.0 ...	4	9
28	3.15 ...	12	3	9.15 ...	6	6	3.15 ...	13	6	10.0 ...	5	0
29	4.0 ...	11	6	10.0 ...	7	6	4.0 ...	13	0	10.30 ...	5	0
30	4.30 ...	11	6	10.30 ...	7	9	5.30 ...	12	0	11.15 ...	5	9
31	6.0 ...	11	6	11.30 ...	8	6	6.0 ...	11	9	11.45 ...	5	0

AUGUST 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	7.0 A.M.	12	0	11.45 A.M.	8	6	7.15 P.M.	12	0	0.0 P.M.	0	0
2	0.15 ...	4	6	7.30 ...	13	0	1.15 ...	8	6	8.0 ...	11	9
S 3	2.45 ...	4	0	8.30 ...	13	9	3.0 ...	8	3	9.30 ...	12	0
4	3.30 ...	3	9	9.45 ...	15	0	3.45 ...	7	0	10.0 ...	13	3
5	4.0 ...	3	0	10.30 ...	15	9	4.0 ...	6	0	11.0 ...	14	0
6	4.30 ...	2	0	11.30 ...	16	6	5.45 ...	5	0	11.45 ...	14	6
7	6.0 ...	1	6	12.0 ...	17	0	6.0 ...	4	0	12.15 ...	15	0
8	6.30 ...	1	6	12.30 ...	17	0	6.30 ...	4	0	1.0 ...	15	0
9	7.0 ...	2	6	1.30 ...	16	9	7.0 ...	5	0	1.30 ...	14	9
10	7.30 ...	4	6	2.0 ...	16	0	8.30 ...	6	0	2.30 ...	14	3
11	8.0 ...	5	6	2.30 ...	15	6	9.0 ...	6	6	3.0 ...	14	0
12	9.30 ...	7	0	3.30 ...	13	6	11.0 ...	8	6	4.0 ...	13	0
13	11.30 ...	7	3	4.30 ...	13	0	11.30 ...	7	6	4.15 ...	13	0
14	11.30 ...	9	0	0.0 ...	0	0	0.0 ...	0	0	6.0 ...	11	6
15	0.30 ...	5	6	7.0 ...	12	9	1.0 ...	9	0	7.0 ...	11	6
16	1.0 ...	5	0	8.0 ...	13	6	1.30 ...	9	0	8.45 ...	11	9
17	2.30 ...	6	0	9.15 ...	14	0	3.0 ...	7	6	9.30 ...	12	3
18	3.15 ...	4	6	10.0 ...	14	9	4.0 ...	7	0	10.30 ...	13	3
19	4.30 ...	4	0	10.45 ...	15	3	4.45 ...	6	6	11.15 ...	13	6
20	5.0 ...	3	9	11.30 ...	15	6	5.45 ...	5	6	11.45 ...	14	0
21	6.0 ...	3	6	0.0 ...	0	0	0.30 ...	15	6	6.15 ...	4	6
22	0.30 ...	14	0	6.30 ...	15	3	1.0 ...	15	3	6.45 ...	4	3
23	1.0 ...	14	0	7.0 ...	4	6	1.30 ...	15	0	7.0 ...	4	0
24	1.0 ...	14	0	7.30 ...	5	0	1.30 ...	14	0	7.45 ...	4	6
25	1.45 ...	13	9	7.30 ...	5	6	2.0 ...	13	9	8.0 ...	4	0
26	1.15 ...	13	0	8.15 ...	6	0	2.0 ...	13	3	9.0 ...	3	9
27	2.30 ...	12	6	9.30 ...	7	0	3.0 ...	12	9	9.30 ...	5	0
28	3.30 ...	12	0	10.0 ...	8	9	4.0 ...	12	3	10.0 ...	4	9
29	4.30 ...	12	0	11.0 ...	9	6	5.0 ...	11	3	11.30 ...	6	0
30	5.30 ...	11	6	0.0 ...	0	0	0.12 ...	9	6	6.30 ...	10	9
31	1.0 ...	6	9	7.0 ...	12	3	1.45 ...	8	6	7.30 ...	11	3

SEPTEMBER 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
S 1	1.30 A.M.	4	3	8.30 A.M.	13	6	2.0 P.M.	7	6	9.0 P.M.	12	6
2	2.45 ...	3	9	9.0 ...	14	6	3.30 ...	5	6	9.45 ...	13	6
3	3.30 ...	2	9	10.30 ...	15	9	4.0 ...	4	9	10.45 ...	14	6
4	4.30 ...	2	0	11.0 ...	16	9	4.30 ...	3	6	11.30 ...	15	9
5	5.0 ...	2	0	0.0 ...	0	0	0.15 ...	17	3	5.0 ...	2	0
6	0.15 ...	17	0	6.0 ...	2	0	0.45 ...	17	6	6.15 ...	2	0
7	1.0 ...	17	3	6.30 ...	3	6	1.15 ...	17	3	7.0 ...	3	0
8	1.15 ...	16	0	7.15 ...	4	6	1.45 ...	16	0	9.0 ...	5	6
9	2.30 ...	13	3	9.30 ...	7	6	3.0 ...	12	9	8 0 ...	5	3
10	3.0 ...	13	0	9.45 ...	7	6	3.15 ...	13	0	9.30 ...	4	6
11	3.30 ...	12	6	10.0 ...	8	0	4.0 ...	11	6	11.0 ...	5	6
12	5.0 ...	12	6	11.30 ...	8	6	5.30 ...	10	3	11.30 ...	7	6
13	6.30 ...	12	6	0.0 ...	0	0	0.15 ...	9	0	8.0 ...	10	3
14	0.30 ...	6	0	8.30 ...	13	0	1.30 ...	8	0	8.15 ...	11	6
15	2.30 ...	6	0	8.30 ...	12	6	3.0 ...	6	6	9.15 ...	12	3
16	3.30 ...	4	6	10.0 ...	14	0	4.0 ...	5	6	10.30 ...	12	9
17	4.0 ...	4	0	11.0 ...	14	3	5.0 ...	5	0	11.30 ...	13	0
18	5.0 ...	4	0	11.30 ...	14	6	5.30 ...	3	9	11.45 ...	13	6
19	6.0 ...	4	0	0.0 ...	0	0	0.15 ...	14	9	6.0 ...	4	6
20	0.15 ...	14	0	6.15 ...	4	0	0.45 ...	15	0	6.15 ...	3	0
21	0.45 ...	14	3	6.30 ...	5	0	1.30 ...	14	6	6.30 ...	3	0
22	1.0 ...	14	3	7.0 ...	5	0	1.45 ...	14	0	6.30 ...	3	6
23	1.15 ...	14	3	7.15 ...	6	0	1.45 ...	13	3	7.0 ...	4	0
24	1.30 ...	13	9	7.30 ...	6	9	2.0 ...	12	9	8.0 ...	4	0
25	2.0 ...	13	3	8.30 ...	7	6	2.15 ...	12	0	9.15 ...	4	9
26	3.0 ...	12	3	9.30 ...	8	0	3.15 ...	10	9	9.30 ...	5	0
27	3.15 ...	11	6	10.0 ...	8	6	5.0 ...	10	0	11.30 ...	5	6
28	6.0 ...	11	0	0.0 ...	0	0	0.15 ...	8	6	6.30 ...	10	9
29	0.30 ...	5	3	7.0 ...	12	0	1.30 ...	7	6	8.0 ...	11	0
30	1.30 ...	4	6	8.30 ...	13	6	2.0 ...	6	0	8.0 ...	12	3

OCTOBER 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.30 A.M.	4	6	9.0 A.M.	14	6	3.0 P.M.	4	6	9.30 P.M.	14	0
2	3.30 ...	3	6	10.0 ...	15	9	4.0 ...	3	0	10.0 ...	15	0
3	3.30 ...	3	0	10.30 ...	16	0	4.15 ...	4	0	10.45 ...	17	0
4	4.30 ...	2	6	11.30 ...	17	0	5.0 ...	2	0	11 30 ...	17	3
5	5.30 ...	1	0	0 0 ...	0	0	0.15 ...	17	0	6.0 ...	1	0
6	0.15 ...	17	3	7.0 ...	4	0	1.0 ...	16	0	6.45 ...	1	6
7	1.0 ...	17	0	7.30 ...	4	9	1.15 ...	15	0	8.0 ...	2	0
8	1.30 ...	16	0	8.30 ...	6	9	1.45 ...	13	9	9.0 ...	4	0
9	2.15 ...	15	0	10.0 ...	7	6	2.30 ...	12	3	10.0 ...	5	0
10	3.0 ...	13	0	11.30 ...	8	0	4.0 ...	11	0	11.30 ...	5	6
11	4.0 ...	12	0	11.45 ...	8	0	5.30 ...	10	0	0.0 ...	0	0
12	0.15 ...	6	6	6.0 ...	12	0	1.0 ...	7	6	6.30 ...	10	0
13	1.0 ...	7	0	7.0 ...	12	6	1.30 ...	6	9	8.0 ...	11	0
14	2 0 ...	7	0	8.0 ...	13	0	2.15 ...	6	0	8.30 ...	12	6
15	2.30 ...	6	9	8.30 ...	13	6	2.30 ...	5	6	9.30 ...	13	6
16	3.0 ...	7	6	9.45 ...	14	0	3.30 ...	4	6	9.45 ...	14	3
17	4.0 ...	6	6	10.0 ...	14	6	4.30 ...	4	0	10.30 ...	15	0
18	5.0 ...	6	0	11.0 ...	14	6	5.45 ...	3	6	11.0 ...	15	3
19	5.30 ...	6	0	11.30 ...	14	6	5.45 ...	3	0	11.45 ...	15	9
20	6.30 ...	6	0	0.0 ...	0	0	0.15 ...	14	0	6.30 ...	3	0
21	0.15 ...	15	9	7.0 ...	6	6	0.30 ...	15	9	7.0 ...	4	0
22	0.30 ...	15	0	7.30 ...	6	6	1.0 ...	13	0	7.0 ...	4	0
23	12.30 ...	14	0	7.30 ...	6	9	1.0 ...	12	0	7.45 ...	4	6
24	1.15 ...	13	3	8.0 ...	7	6	1.30 ...	11	9	9.30 ...	5	6
25	1.30 ...	12	9	9.30 ...	8	5	1.30 ...	11	3	9.30 ...	6	0
26	3.0 ...	12	6	10.0 ...	8	6	3.30 ...	10	9	10 30 ...	6	6
27	5.30 ...	12	6	10.30 ...	8	3	5.30 ...	10	6	11.0 ...	6	9
28	6.0 ...	13	0	11.30 ...	7	6	6.30 ...	11	6	11.45 ...	7	0
29	7.0 ...	13	9	0.0 ...	0	0	0.45 ...	5	9	8.0 ...	13	6
30	1.30 ...	5	9	8.30 ...	14	3	2.0 ...	4	0	9.30 ...	15	0
31	3.0 ...	5	6	9.45 ...	15	3	3.30 ...	2	0	10.0 ...	16	3

NOVEMBER 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.0 A.M.	5	0	10.30 A.M.	15	9	4.15 P.M.	1	0	11.0 P.M.	17	0
2	4.30 ...	4	6	11.15 ...	15	9	5.45 ...	1	0	11.45 ...	17	6
3	6.0 ...	4	9	0.0 ...	0	0	0.15 ...	15	6	6.0 ...	1	6
4	12.0 ...	17	6	6.30 ...	5	0	12.15 ...	15	0	6.45 ...	3	0
5	12.30 ...	17	3	7.0 ...	6	0	1.0 ...	14	3	8.0 ...	3	9
6	1.30 ...	16	6	8.30 ...	6	6	2.0 ...	13	0	8.15 ...	4	0
7	2.30 ...	15	0	8.30 ...	7	6	2.45 ...	12	0	9.30 ...	4	9
8	2.30 ...	13	9	10.0 ...	8	0	3.45 ...	11	3	11.0 ...	5	9
9	4.0 ...	13	0	11.30 ...	8	6	4.45 ...	10	6	11.45 ...	5	9
10	5.0 ...	12	9	0.0 ...	0	0	0.30 ...	8	0	5.0 ...	10	6
11	12.0 ...	6	6	6.0 ...	12	6	12.30 ...	7	0	6.30 ...	10	9
12	12.30 ...	7	0	7.0 ...	13	0	1.0 ...	7	0	8.0 ...	11	9
13	1.0 ...	7	0	8.15 ...	13	6	2.15 ...	6	0	8.45 ...	13	6
14	2.30 ...	6	9	9.30 ...	13	6	3.0 ...	4	9	9.0 ...	14	6
15	3.0 ...	6	9	9.30 ...	13	9	3.30 ...	4	0	10.0 ...	15	0
16	3.30 ...	6	3	10.30 ...	13	9	4.0 ...	3	3	10.45 ...	15	6
17	4 15 ...	5	9	11.0 ...	13	9	4.30 ...	3	6	11.30 ...	16	0
18	4.30 ...	7	0	11.45 ...	13	9	4.30 ...	3	6	0.0 ...	0	0
19	0.15 ...	16	6	5.0 ...	7	0	0.15 ...	13	9	5.30 ...	3	3
20	0.30 ...	16	3	6.30 ...	7	6	1.0 ...	13	6	7.0 ...	4	0
21	1.30 ...	15	6	7.15 ...	7	9	1.45 ...	13	3	7.30 ...	4	6
22	1.30 ...	15	0	7.30 ...	8	0	2.0 ...	13	0	8.0 ...	5	0
23	2.0 ...	14	0	8.0 ...	7	6	2.15 ...	12	0	8.30 ...	5	0
24	3.0 ...	14	0	9.0 ...	7	6	3.30 ...	11	9	11.0 ...	5	6
25	5.0 ...	13	3	11 30 ...	6	3	5.30 ...	10	9	11.45 ...	6	0
26	6.0 ...	13	0	0.0 ...	5	6	6.0 ...	11	0	0.0 ...	0	0
27	0.30 ...	7	6	7.0 ...	13	6	1.0 ...	4	6	7.45 ...	13	3
28	1.45 ...	6	6	8.0 ...	13	3	2.0 ...	3	6	9.15 ...	14	6
29	3.30 ...	6	6	9.30 ...	13	9	3.30 ...	3	0	9.30 ...	15	9
30	3.30 ...	6	0	9.45 ...	14	3	4.0 ...	1	0	10.30 ...	16	6

DECEMBER 1838.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.30 A.M.	6	6	10.45 A.M.	14	6	5.30 P.M.	1	6	11.45 P.M.	17	3
2	6.0 ...	6	0	0.0 ...	0	0	0.15 ...	14	6	6.30 ...	1	6
3	0.30 ...	17	6	6.0 ...	5	9	1.0 ...	14	6	7.0 ...	3	0
4	1.30 ...	16	9	7.15 ...	6	0	2.0 ...	13	6	8.0 ...	4	6
5	2.0 ...	15	9	8.30 ...	6	6	2.30 ...	13	0	9.0 ...	7	0
6	2.30 ...	15	0	9.30 ...	7	0	3.0 ...	11	6	9.30 ...	5	6
7	3.0 ...	14	0	10.30 ...	7	6	3.15 ...	10	9	11.0 ...	5	6
8	4.0 ...	13	0	11.30 ...	7	0	4.30 ...	10	6	11.30 ...	5	9
9	4.45 ...	13	6	11.45 ...	7	6	5.0 ...	10	0	0.0 ...	0	0
10	0.15 ...	6	3	5.0 ...	12	6	0.30 ...	6	9	7.0 ...	11	3
11	0.30 ...	7	3	7.30 ...	12	3	2.0 ...	5	6	7.30 ...	12	0
12	1.30 ...	7	9	8.0 ...	11	9	2.30 ...	4	9	9.0 ...	13	9
13	2.30 ...	7	6	9.30 ...	11	9	3.30 ...	4	0	10.0 ...	14	6
14	3.0 ...	7	6	10.0 ...	12	6	4.0 ...	4	0	10.30 ...	15	3
15	3.30 ...	7	0	10.30 ...	12	9	4.30 ...	3	6	11.0 ...	15	9
16	4.0 ...	5	9	11.15 ...	12	9	5.0 ...	3	6	11.30 ...	15	9
17	4.30 ...	6	6	11.30 ...	13	6	5.30 ...	3	6	11.45 ...	16	3
18	5.45 ...	7	0	0.0 ...	0	0	0.15 ...	13	9	5.0 ...	2	6
19	0.30 ...	16	3	5.30 ...	7	0	1.30 ...	13	6	6.0 ...	3	0
20	1.30 ...	16	0	6.30 ...	6	9	1.45 ...	13	6	6.45 ...	3	0
21	2.0 ...	16	0	7.0 ...	6	6	2.15 ...	13	3	8.30 ...	4	0
22	2.30 ...	15	6	8.30 ...	6	0	2.30 ...	12	9	9.30 ...	5	3
23	3.30 ...	15	0	9.45 ...	4	9	3.30 ...	12	3	10.30 ...	5	0
24	4.0 ...	14	9	11.0 ...	5	0	4.30 ...	12	3	11.30 ...	6	6
25	4.30 ...	14	0	0.0 ...	0	0	0.15 ...	4	6	5.0 ...	12	0
26	0.30 ...	7	0	5.0 ...	13	6	1.0 ...	4	0	7.30 ...	13	6
27	1.30 ...	7	9	7.30 ...	13	6	1.30 ...	3	6	8.0 ...	14	3
28	2.0 ...	7	6	8.15 ...	12	9	2.15 ...	3	3	9.0 ...	15	6
29	3.0 ...	7	0	9.0 ...	13	6	2.30 ...	3	6	10.30 ...	16	9
30	4.0 ...	6	6	11.30 ...	13	9	4.30 ...	2	3	11.45 ...	17	10
31	4.30 ...	6	0	0.0 ...	0	0	0.15 ...	14	3	5.0 ...	2	0

JANUARY 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.30 A.M.	17	10	5.30 A.M.	5	9	0.30 P.M.	14	6	6.0 P.M.	5	6
2	1.0 ...	17	10	6.15 ...	5	6	1.0 ...	14	3	6.30 ...	3	6
3	1.30 ...	16	6	7.0 ...	6	3	1.30 ...	14	0	7.0 ...	4	0
4	2.0 ...	16	0	7.30 ...	5	3	2.15 ...	13	0	7.45 ...	4	0
5	2.30 ...	15	3	8.0 ...	5	3	2.45 ...	12	6	8.0 ...	4	6
6	2.45 ...	14	6	8.30 ...	5	6	2.45 ...	12	0	9.0 ...	5	0
7	3.0 ...	14	0	9.0 ...	6	0	3.15 ...	11	9	11.0 ...	5	9
8	4.0 ...	13	0	11.30 ...	6	6	4.30 ...	11	0	11.30 ...	6	0
9	5.0 ...	12	6	11.45 ...	6	9	6.0 ...	11	0	0.0 ...	0	0
10	0.15 ...	8	0	6.30 ...	12	0	0.30 ...	6	0	6.0 ...	11	3
11	1.0 ...	9	0	6.30 ...	11	9	12.30 ...	6	0	7.0 ...	11	6
12	1.30 ...	8	0	8.0 ...	12	9	1.30 ...	5	0	9.0 ...	14	3
13	2.0 ...	7	6	8.30 ...	12	0	3.0 ...	4	0	10.0 ...	14	9
14	3.30 ...	7	0	10.30 ...	12	9	4.0 ...	3	0	11.30 ...	15	3
15	5.0 ...	6	9	11.30 ...	13	6	5.30 ...	2	0	0.0 ...	0	0
16	0.15 ...	16	3	6.0 ...	6	6	0.30 ...	13	9	6.0 ...	1	0
17	0.30 ...	16	6	6.30 ...	5	6	1.0 ...	14	3	6.30 ...	1	0
18	1.0 ...	16	9	7.30 ...	5	0	1.15 ...	14	6	7.30 ...	1	6
19	1.45 ...	16	9	8.0 ...	4	0	2.0 ...	14	6	8.0 ...	2	6
20	2.0 ...	16	9	8.30 ...	2	9	2.30 ...	14	0	8.45 ...	4	0
21	2.30 ...	16	0	9.0 ...	3	0	3.45 ...	13	9	9.30 ...	3	6
22	4.0 ...	14	6	10.0 ...	3	6	4.15 ...	13	0	10.0 ...	4	6
23	4.15 ...	13	10	10.30 ...	4	0	4.30 ...	11	9	11.30 ...	5	0
24	4.30 ...	12	3	12.0 ...	4	3	7.0 ...	12	6	0.0 ...	0	0
25	0.30 ...	5	6	7.15 ...	12	0	2.0 ...	4	3	7.0 ...	13	3
26	3.0 ...	6	0	7.30 ...	16	6	4.0 ...	4	0	10.0 ...	14	6
27	3.30 ...	7	0	9.45 ...	12	0	3.45 ...	8	3	10.0 ...	15	3
28	4.0 ...	6	9	10.30 ...	12	6	4.0 ...	2	6	11.30 ...	15	9
29	6.0 ...	5	6	11.45 ...	13	6	6.30 ...	4	0	0.45 ...	16	0
30	6.0 ...	6	0	0.0 ...	0	0	12.0 ...	16	0	6.30 ...	4	0
31	7.0 ...	14	6	5.0 ...	3	0	0.30 ...	15	9	5.45 ...	4	0

FEBRUARY 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.45 A.M.	14	6	7.45 A.M.	5	0	1.0 P.M.	15	6	7.30 P.M.	4	0
2	1.30 ...	14	0	7.30 ...	6	6	1.45 ...	15	6	8.0 ...	4	6
3	1.45 ...	14	0	7.45 ...	6	6	2.30 ...	13	6	9.0 ...	5	0
4	2.30 ...	14	6	8.30 ...	5	6	3.0 ...	14	0	9.15 ...	5	6
5	2.45 ...	15	0	9.0 ...	5	6	3.15 ...	13	0	9.30 ...	5	0
6	3.30 ...	12	9	9.30 ...	5	0	4.0 ...	12	6	10.45 ...	8	0
7	4.0 ...	12	6	10.0 ...	5	0	5.0 ...	11	3	11.0 ...	8	0
8	5.30 ...	12	0	11.0 ...	6	0	6.0 ...	11	6	11.45 ...	6	6
9	6.30 ...	11	0	0.0 ...	0	0	1 30 ...	8	6	7.0 ...	12	6
10	2.0 ...	6	9	7.30 ...	11	0	2.30 ...	5	0	9.0 ...	13	3
11	2.30 ...	7	6	9.30 ...	11	6	3.30 ...	4	0	9.30 ...	12	6
12	3.0 ...	3	9	9.30 ...	14	6	3.30 ...	6	9	10.0 ...	14	0
13	4.0 ...	3	0	10.30 ...	15	0	4.30 ...	6	0	11.0 ...	16	6
14	5.0 ...	5	0	11.30 ...	15	0	5.0 ...	5	0	11.45 ...	17	3
15	5.45 ...	3	9	0.0 ...	0	0	0.15 ...	15	9	6.0 ...	1	6
16	0.30 ...	17	6	6.30 ...	3	0	0.45 ...	16	3	6.30 ...	1	0
17	1.0 ...	17	3	7.30 ...	2	6	1.30 ...	16	3	7.0 ...	2	0
18	2.0 ...	17	3	8.0 ...	2	0	2.15 ...	15	9	8.0 ...	4	6
19	2.30 ...	16	2	8.45 ...	2	3	2.45 ...	15	0	9.0 ...	5	0
20	3.30 ...	15	0	9.30 ...	3	6	3.45 ...	13	9	10.0 ...	6	0
21	4.0 ...	13	6	10.30 ...	4	6	4.30 ...	12	9	11.0 ...	6	6
22	5.30 ...	12	6	11.30 ...	5	0	5.0 ...	11	6	0.0 ...	0	0
23	0.30 ...	6	6	6.0 ...	10	6	1.30 ...	4	6	7.0 ...	10	6
24	1.0 ...	5	9	7.30 ...	11	6	1.30 ...	5	0	8.0 ...	11	6
25	2.0 ...	6	0	8.30 ...	12	0	2.30 ...	5	0	9.0 ...	14	3
26	2.45 ...	5	6	10.0 ...	12	0	3.0 ...	4	0	11.0 ...	15	0
27	3.30 ...	4	0	11.15 ...	13	6	4.0 ...	3	6	11.45 ...	16	0
28	4.30 ...	4	6	0.0 ...	0	0	0.15 ...	14	9	4.0 ...	5	0

MARCH 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.30 A.M.	16	0	6.0 A.M.	4	0	1.0 P.M.	14	9	6.0 P.M.	5	0
2	1.30 ...	16	0	6.0 ...	4	3	1.30 ...	14	9	7.0 ...	6	0
3	2.0 ...	16	0	7.30 ...	4	0	2.0 ...	14	9	8.0 ...	6	0
4	2.30 ...	15	9	8.0 ...	4	0	2.15 ...	14	6	8.30 ...	6	6
5	2.0 ...	14	9	8.30 ...	4	0	2.15 ...	13	9	8.30 ...	7	0
6	2.30 ...	14	0	8.45 ...	4	6	3.0 ...	13	3	9.0 ...	8	6
7	3.0 ...	13	3	9.0 ...	5	6	3.30 ...	13	0	10.30 ...	8	3
8	4.30 ...	12	6	9.45 ...	6	0	4.30 ...	12	0	11.0 ...	8	0
9	5.0 ...	12	0	11.0 ...	6	6	6.0 ...	11	6	11.45 ...	8	6
10	6.30 ...	10	9	0.0 ...	0	0	0.30 ...	6	0	7.0 ...	12	3
11	1.0 ...	8	0	7.0 ...	10	9	1.0 ...	5	6	8.0 ...	13	0
12	2.0 ...	7	0	8.0 ...	11	6	2.30 ...	4	6	9.30 ...	14	6
13	3.30 ...	7	6	9.45 ...	13	0	3.30 ...	4	0	10.0 ...	15	9
14	4.0 ...	7	0	10.30 ...	14	6	4.30 ...	4	0	10.45 ...	16	6
15	5.0 ...	4	0	11.0 ...	16	0	4.45 ...	3	3	11.30 ...	17	0
16	5.15 ...	2	6	11.45 ...	16	6	5.30 ...	2	6	0.0 ...	0	0
17	0.15 ...	17	3	6.0 ...	1	6	0.30 ...	17	0	6.30 ...	3	0
18	1.0 ...	17	3	6.30 ...	1	0	1.0 ...	17	0	8.30 ...	5	0
19	1.30 ...	16	9	8.45 ...	2	0	2.0 ...	16	9	9.0 ...	7	0
20	2.15 ...	16	0	9.30 ...	2	3	3.0 ...	15	6	9.30 ...	7	6
21	3.30 ...	14	0	10.0 ...	3	6	3.30 ...	13	9	10.0 ...	8	0
22	4.0 ...	13	0	10.30 ...	4	6	4.0 ...	13	0	11.30 ...	8	6
23	6.0 ...	16	9	11.45 ...	6	6	4.30 ...	12	0	0.0 ...	0	0
24	0.15 ...	8	0	4.30 ...	12	6	4.0 ...	6	6	5.0 ...	11	6
25	1.30 ...	8	0	5.0 ...	10	6	1.0 ...	6	0	8.30 ...	13	0
26	3.0 ...	5	6	8.30 ...	12	0	3.0 ...	5	6	9.0 ...	14	3
27	4.0 ...	5	0	9.30 ...	13	0	4.0 ...	5	0	10.0 ...	15	3
28	3.0 ...	4	6	10.30 ...	14	0	4.15 ...	5	0	10.45 ...	15	6
29	3.30 ...	4	0	11.0 ...	14	6	4.30 ...	5	0	11.0 ...	15	6
30	5.0 ...	3	9	11.30 ...	15	3	4.0 ...	4	0	11.0 ...	15	6
31	4.45 ...	5	6	11.0 ...	14	9	5.0 ...	5	6	11.45 ...	15	6

APRIL 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.0 A.M.	4	0	10.30 A.M.	15	6	6.0 P.M.	6	0	0.0 P.M.	0	0
2	0.30 ...	15	0	6.0 ...	4	0	0.30 ...	14	6	6.45 ...	6	3
3	1.0 ...	14	3	7.30 ...	7	6	1.30 ...	13	3	7.0 ...	7	0
4	1.30 ...	13	6	8.0 ...	7	9	2.0 ...	14	0	7.30 ...	7	0
5	2.0 ...	12	6	8.30 ...	6	0	3.0 ...	13	9	8 15 ...	5	0
6	3.30 ...	12	6	10.0 ...	5	6	4.0 ...	12	6	8.30 ...	5	6
7	4.0 ...	12	3	10.15 ...	5	0	4.30 ...	12	0	10.30 ...	10	0
8	5.0 ...	11	6	11.0 ...	5	6	6.30 ...	12	6	0.0 ...	0	0
9	0.45 ...	8	6	7.0 ...	11	0	1.0 ...	6	0	8.0 ...	14	3
10	2.0 ...	6	9	8.30 ...	12	0	2.15 ...	5	0	9.0 ...	14	6
11	3.0 ...	5	0	9.15 ...	13	3	3.15 ...	4	6	9.30 ...	15	3
12	4.0 ...	4	0	10.0 ...	15	0	4.15 ...	3	3	11.0 ...	15	9
13	5.0 ...	2	6	11.15 ...	16	3	5.0 ...	4	0	11.15 ...	16	6
14	5.30 ...	1	6	11.45 ...	17	6	5.45 ...	4	6	0.0 ...	0	0
15	0.15 ...	17	0	6.0 ...	1	0	0.30 ...	17	9	6.30 ...	4	9
16	0.45 ...	17	3	7.0 ...	1	0	1.0 ...	17	9	7.0 ...	5	3
17	1.0 ...	16	9	7.30 ...	1	0	1.30 ...	17	0	8.0 ...	6	0
18	1.30 ...	16	0	8.30 ...	2	6	1.45 ...	15	6	9.0 ...	7	6
19	2.0 ...	14	6	9.30 ...	4	0	2.30 ...	13	6	9.45 ...	8	9
20	3.0 ...	13	0	10.0 ...	5	6	3.30 ...	13	0	10.45 ...	9	0
21	5.30 ...	12	3	11.30 ...	6	9	5.30 ...	12	9	11 45 ...	9	3
22	6.30 ...	10	9	0.0 ...	0	0	0.15 ...	7	6	7.0 ...	12	6
23	0.30 ...	7	9	7.30 ...	11	0	1.0 ...	6	6	8.0 ...	12	0
24	2.0 ...	7	0	8.15 ...	13	0	2.15 ...	6	0	9.0 ...	14	0
25	2.45 ...	5	0	9.0 ...	13	3	3.0 ...	6	3	9.30 ...	14	6
26	3.15 ...	5	0	10.0 ...	14	0	4.30 ...	6	6	10.30 ...	14	6
27	4.15 ...	4	0	11.30 ...	14	9	6.30 ...	6	9	11.45 ...	15	0
28	6.0 ...	3	0	0.0 ...	0	0	0.30 ...	15	6	6.0 ...	16	6
29	0.30 ...	15	0	6.15 ...	3	0	0.45 ...	15	6	6.30 ...	5	9
30	0.45 ...	15	3	6.45 ...	3	3	1.0 ...	15	6	7.0 ...	6	9

MAY 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.0 A.M.	15	6	7.0 A.M.	3	0	1.15 P.M.	15	3	8 0 P.M.	8	0
2	1.15 ...	15	0	8.30 ...	3	6	1.30 ...	15	3	8.0 ...	8	0
3	1.45 ...	13	6	8.30 ...	3	6	2.0 ...	14	0	8.30 ...	8	6
4	2.30 ...	12	0	9.0 ...	4	0	2.30 ...	13	6	10.0 ...	9	0
5	4.0 ...	10	9	10.30 ...	6	0	4.30 ...	12	9	10.30 ...	9	6
6	4.30 ...	11	0	11.0 ...	6	0	4.45 ...	12	9	11.0 ...	8	0
7	5.0 ...	10	9	11.0 ...	6	0	5.30 ...	12	9	11.30 ...	7	6
8	7.0 ...	11	3	11.45 ...	6	0	7.0 ...	13	3	0.0 ...	0	0
9	0.15 ...	7	6	7.30 ...	12	6	0 30 ...	5	9	8.0 ...	14	0
10	2.0 ...	4	0	8.30 ...	14	3	2.15 ...	6	0	9.0 ...	15	0
11	3.0 ...	2	6	9.30 ...	15	9	3.30 ...	5	6	10.0 ...	15	9
12	4.0 ...	1	0	10.30 ...	16	9	4.30 ...	5	3	10.30 ...	15	9
13	5.0 ...	1	0	11.0 ...	17	6	5.0 ...	5	0	11.30 ...	15	9
14	5.30 ...	1	0	11.45 ...	17	6	5.45 ...	5	0	0.0 ...	0	0
15	0.15 ...	15	9	6.0 ...	1	0	0.30 ...	17	0	6.30 ...	5	0
16	1.0 ...	15	3	7.0 ...	1	0	1.30 ...	16	0	8.0 ...	6	9
17	2.30 ...	14	0	8.30 ...	4	6	2.15 ...	14	9	8.30 ...	6	6
18	2.45 ...	14	0	8 30 ...	4	6	3.0 ...	14	6	9.30 ...	7	6
19	4.0 ...	13	0	10.0 ...	5	6	4.0 ...	14	0	10.30 ...	8	6
20	4.30 ...	12	0	11.0 ...	6	6	4.30 ...	13	0	11.30 ...	8	6
21	5.30 ...	11	6	11.45 ...	7	0	5.0 ...	12	6	0.0 ...	0	0
22	1.0 ...	8	0	5.30 ...	12	0	0.30 ...	7	6	6.0 ...	13	6
23	1.15 ...	7	0	6.0 ...	13	0	1.0 ...	7	0	6.30 ...	12	0
24	1.30 ...	9	0	7.0 ...	14	0	2.0 ...	6	9	9.0 ...	13	6
25	3.0 ...	6	0	9.30 ...	14	0	3.30 ...	7	0	9.30 ...	13	9
26	4.0 ...	5	0	10.0 ...	14	6	4.0 ...	7	6	10.30 ...	14	0
27	4.30 ...	4	6	11.0 ...	15	0	4.0 ...	7	6	11.0 ...	14	0
28	5.0 ...	4	0	0.0 ...	0	0	0.15 ...	15	3	5.30 ...	7	6
29	0.30 ...	13	9	5.30 ...	3	0	0.30 ...	15	6	6.0 ...	7	9
30	1.0 ...	13	6	6.0 ...	3	3	1.0 ...	15	6	6.30 ...	8	0
31	1.30 ...	13	0	6.30	4	0	1.30 ...	15	3	7.0 ...	8	3

JUNE 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.0 A.M.	12	9	7.0 A.M.	4	3	2.0 P.M.	15	0	7.30 P.M.	8	6
2	2.30 ...	12	6	7.30 ...	4	3	2.30 ...	14	9	8.0 ...	8	9
3	3.0 ...	12	0	8.0 ...	4	6	3.0 ...	14	3	9.0 ...	8	0
4	3.45 ...	12	6	10.0 ...	6	0	4.0 ...	13	9	10.30 ...	7	9
5	4.30 ...	12	3	10.30 ...	6	6	5.0 ...	13	6	11.0 ...	6	0
6	5.0 ...	12	6	11.30 ...	7	0	5.30 ...	13	6	0.0 ...	0	0
7	0.15 ...	6	6	6.0 ...	13	9	0.30 ...	7	6	8.0 ...	14	3
8	1.0 ...	4	6	8.30 ...	15	0	1.30 ...	8	0	9.0 ...	14	0
9	2.30 ...	3	0	9.30 ...	15	6	3.0 ...	7	6	10.0 ...	14	3
10	3.0 ...	2	6	10.0 ...	16	0	3.30 ...	7	0	10.0 ...	14	6
11	4.0 ...	1	0	10.30 ...	16	9	5.0 ...	6	6	11.0 ...	14	6
12	5.0 ...	1	0	11.30 ...	17	0	6.0 ...	5	6	11.30 ...	14	9
13	6.0 ...	1	6	0.0 ...	0	0	0.30 ...	16	9	6.45 ...	5	6
14	1.0 ...	14	0	7.0 ...	3	0	1.15 ...	16	0	7.30 ...	6	6
15	1.30 ...	13	9	7.30 ...	3	9	2.0 ...	15	9	8.45 ...	6	0
16	2.45 ...	13	0	9.15 ...	5	6	3.0 ...	14	9	9.30 ...	6	6
17	3.30 ...	12	3	9.45 ...	6	0	4.0 ...	14	6	11.0 ...	7	0
18	3.45 ...	12	0	11.15 ...	6	9	4.0 ...	14	0	11.30 ...	7	0
19	5.30 ...	11	0	11.45 ...	8	0	5.30 ...	13	6	0.0 ...	0	0
20	0.15 ...	8	0	6.0 ...	11	0	0.30 ...	8	6	6.0 ...	13	0
21	0.15 ...	8	3	6.30 ...	11	9	0.30 ...	9	0	7.0 ...	12	6
22	1.0 ...	8	3	7.30 ...	12	9	1.30 ...	8	9	8.30 ...	11	9
23	2.30 ...	6	0	9.0 ...	13	3	2.30 ...	9	3	9.0 ...	12	0
24	3.30 ...	5	6	9.30 ...	13	9	3.30 ...	9	0	10.0 ...	12	3
25	3.30 ...	4	0	10.30 ...	14	6	3.45 ...	8	6	10.30 ...	12	6
26	4.30 ...	3	6	10.45 ...	15	0	4.30 ...	8	0	10.45 ...	12	9
27	4.45 ...	3	0	11.30 ...	15	6	5.30 ...	7	6	11.45 ...	13	0
28	6.0 ...	2	6	0.0 ...	0	0	0.30 ...	15	8	6.0 ...	6	6
29	12.0 ...	13	3	6.30 ...	2	0	1.0 ...	15	9	7.0 ...	6	6
30	1.0 ...	13	0	7.0 ...	3	0	1.30 ...	15	6	8.0 ...	6	9

JULY 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.30 A.M.	12	9	8.0 A.M.	4	0	2.0 P.M.	15	6	8.30 P.M.	7	0
2	2.30 ...	12	6	8.30 ...	5	0	2.45 ...	15	3	9.0 ...	7	0
3	3.0 ...	12	3	9.30 ...	5	6	4.0 ...	15	0	10.0 ...	6	6
4	4.30 ...	12	0	10.30 ...	7	6	4.30 ...	14	9	11.0 ...	6	0
5	5.0 ...	12	0	11.30 ...	8	0	6.30 ...	14	3	0.0 ...	0	0
6	0.30 ...	4	6	6.30 ...	13	3	1.0 ...	8	0	7.30 ...	13	3
7	2.0 ...	3	6	7.30 ...	14	0	2.0 ...	8	3	8.30 ...	13	0
8	2.30 ...	3	0	8.30 ...	14	9	2.30 ...	7	9	9.15 ...	13	0
9	3.30 ...	3	0	9.30 ...	15	3	3.30 ...	7	0	10.0 ...	13	3
10	3.0 ...	2	6	10.30 ...	16	0	4.30 ...	6	6	11.0 ...	13	6
11	5.0 ...	2	0	11.30 ...	16	6	5.30 ...	6	0	11.30 ...	14	0
12	5.30 ...	2	6	0.0 ...	0	0	0.15 ...	16	6	6.0 ...	5	6
13	0.30 ...	14	0	6.30 ...	2	0	1.0 ...	16	6	7.0 ...	4	9
14	1.0 ...	14	0	7.15 ...	3	0	1.30 ...	16	3	7.30 ...	5	0
15	1.30 ...	14	9	8.0 ...	4	6	2.0 ...	15	9	8.0 ...	5	6
16	3.0 ...	13	3	9.0 ...	5	6	3.15 ...	15	6	8.30 ...	6	9
17	4.0 ...	13	0	9.15 ...	7	0	4.0 ...	14	9	10.0 ...	7	6
18	5.0 ...	12	6	11.0 ...	8	6	5.30 ...	13	0	11.0 ...	7	6
19	6.0 ...	11	9	11.30 ...	9	6	6.0 ...	13	0	11.45 ...	7	9
20	6.30 ...	11	6	12.0 ...	9	9	6.15 ...	12	6	0.0 ...	0	0
21	0.15 ...	7	0	6.30 ...	12	9	0.30 ...	9	6	7.0 ...	12	9
22	0.30 ...	6	6	7.0 ...	12	9	1.0 ...	9	0	8.30 ...	12	0
23	2.0 ...	7	6	9.0 ...	13	6	3.0 ...	8	6	8.45 ...	12	3
24	2.30 ...	5	0	9.0 ...	14	0	3.30 ...	8	6	9.30 ...	12	6
25	3.30 ...	4	0	10.0 ...	15	0	3.45 ...	8	6	10.45 ...	13	0
26	4.0 ...	3	6	11.15 ...	15	6	4.30 ...	8	0	11.30 ...	13	9
27	5.30 ...	3	9	11.45 ...	16	0	6.30 ...	6	6	11.45 ...	14	9
28	6.0 ...	3	6	0.0 ...	0	0	0.0 ...	16	6	6.30 ...	6	3
29	0.15 ...	15	0	6.30 ...	3	3	1.0 ...	16	6	7.0 ...	5	0
30	1.0 ...	15	0	9.0 ...	3	0	1.30 ...	16	6	7.0 ...	5	0
31	2.0 ...	15	3	8.0 ...	5	0	2.15 ...	16	6	9.0 ...	4	6

AUGUST 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.30 A.M.	15	0	9.0 A.M.	5	6	3.0 P.M.	15	9	9.30 P.M.	5	0
2	3.30 ...	14	6	10.0 ...	7	6	4.0 ...	14	9	9.45 ...	5	6
3	4.30 ...	13	6	10.15 ...	8	0	4.30 ...	14	3	11.0 ...	5	6
4	5.0 ...	13	0	0.0 ...	0	0	12.0 ...	8	0	6.0 ...	12	9
5	12.30 ...	5	6	7.0 ...	14	0	1.0 ...	8	6	7.30 ...	12	3
6	1.0 ...	5	0	8.0 ...	14	3	2.0 ...	8	6	9.0 ...	12	9
7	3.0 ...	4	6	9.30 ...	15	0	3.30 ...	7	0	9.30 ...	13	3
8	3.30 ...	4	0	10.30 ...	15	6	4.30 ...	6	0	10.0 ...	13	9
9	4.30 ...	3	0	10.45 ...	15	9	4.45 ...	5	0	11.0 ...	14	3
10	5.0 ...	3	0	11.30 ...	16	0	5.30 ...	4	6	11.30 ...	14	6
11	6.0 ...	3	0	0.0 ...	0	0	0.15 ...	15	9	6.30 ...	4	6
12	0.30 ...	14	9	7.0 ...	2	9	1.0 ...	15	6	7.0 ...	4	6
13	1.30 ...	14	9	8.0 ...	5	0	1.30 ...	15	0	8.0 ...	4	6
14	2.0 ...	14	6	8.30 ...	5	6	2.0 ...	14	9	9.0 ...	4	6
15	2.15 ...	13	9	9.30 ...	6	0	2.30 ...	14	0	9.30 ...	5	0
16	2.45 ...	12	9	9.30 ...	6	6	3.0 ...	13	0	11.0 ...	6	0
17	3.30 ...	12	6	10.30 ...	8	0	4.0 ...	12	0	11.45 ...	5	6
18	5.30 ...	11	6	0.0 ...	0	0	0.30 ...	8	6	6.0 ...	11	3
19	1.0 ...	5	0	6.0 ...	10	9	1.30 ...	8	0	6.30 ...	10	6
20	1.30 ...	4	9	7.30 ...	12	0	2.0 ...	9	3	8.15 ...	10	6
S 21	2.30 ...	5	3	8.30 ...	12	9	3.0 ...	9	0	8.45 ...	11	6
22	3.0 ...	4	6	9.0 ...	13	9	3.30 ...	7	6	9.30 ...	12	0
23	3.30 ...	4	6	10.0 ...	15	0	3.45 ...	7	0	10.30 ...	13	0
24	4.30 ...	4	0	11.0 ...	16	0	5.0 ...	6	0	11.0 ...	14	9
25	5.30 ...	3	9	11.30 ...	16	3	5.30 ...	5	6	11.30 ...	15	0
26	6.0 ...	3	6	0.0 ...	0	0	0.0 ...	16	6	6.0 ...	4	0
27	0.30 ...	15	6	6.30 ...	3	0	0.30 ...	16	9	6.45 ...	3	9
28	1.0 ...	15	6	7.0 ...	3	6	1.0 ...	16	6	8.0 ...	3	0
29	2.0 ...	14	9	8.30 ...	3	9	2.30 ...	15	6	8.45 ...	2	0
30	2.45 ...	15	0	9.0 ...	5	6	3.0 ...	14	6	9.30 ...	3	6
31	3.0 ...	14	0	9.30 ...	7	0	3.30 ...	13	6	10.0 ...	4	0

SEPTEMBER 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.0 A.M.	13	3	4.30 A.M.	8	0	5.0 P.M.	12	6	11.30 P.M.	5	0
2	5.30 ...	12	3	11.30 ...	8	6	6.30 ...	11	6	0.0 ...	0	0
3	0.0 ...	5	0	7.0 ...	13	0	1.0 ...	7	9	7.0 ...	11	9
4	1.30 ...	4	6	8.0 ...	13	9	2.0 ...	7	0	9.0 ...	12	3
5	3.0 ...	4	0	9.30 ...	14	6	3.45 ...	5	9	9.15 ...	13	0
6	3.30 ...	3	6	10.0 ...	15	3	4.0 ...	4	6	10.30 ...	14	0
7	4.0 ...	3	0	10.30 ...	15	9	5.0 ...	4	6	11.0 ...	15	3
8	5.30 ...	4	6	11.30 ...	16	0	5.30 ...	3	6	11.30 ...	15	3
9	5.45 ...	3	6	0.0 ...	0	0	0.15 ...	16	0	6 30 ...	4	0
10	0.15 ...	15	0	6.30 ...	4	0	0.30 ...	15	6	6.45 ...	3	0
11	0.30 ...	14	6	7.0 ...	6	0	1.0 ...	14	6	7.15 ...	3	9
12	1.0 ...	13	9	7.30 ...	6	6	1.30 ...	13	9	7.30 ...	4	0
13	2.0 ...	13	9	8.0 ...	7	6	1.45 ...	13	6	8.0 ...	5	6
14	2.15 ...	13	0	8.30 ...	7	6	2.15 ...	12	6	9.0 ...	6	0
15	2.30 ...	12	6	9.0 ...	8	0	2.30 ...	12	0	9.30 ...	6	6
16	3.0 ...	12	0	9.30 ...	8	6	5.0 ...	11	6	10.0 ...	7	0
17	3.45 ...	12	6	10.15 ...	8	6	6.0 ...	10	6	0.0 ...	0	0
18	4.0 ...	6	9	6.45 ...	11	6	1.0 ...	9	0	8.30 ...	11	3
19	4.15 ...	5	9	8.30 ...	12	6	2.30 ...	8	0	8.45 ...	11	6
20	4.30 ...	5	6	9.0 ...	13	6	3.0 ...	7	0	9.0 ...	12	6
21	3.30 ...	4	0	10.0 ...	14	6	4.0 ...	5	6	10.0 ...	14	0
22	4.30 ...	3	6	10.30 ...	15	6	5.0 ...	4	6	10.45 ...	5	3
23	5.30 ...	3	6	11.0 ...	16	6	5.15 ...	4	0	11.15 ...	15	9
24	5.30 ...	3	0	11.30 ...	16	9	5.30 ...	2	6	11.45 ...	16	9
25	6.0 ...	4	0	0.0 ...	0	0	0.15 ...	16	9	6.0 ...	1	0
26	0.15 ...	17	0	6.30 ...	4	6	0.30 ...	16	9	7.0 ...	1	0
27	1.0 ...	17	0	7.30 ...	5	0	1.30 ...	15	6	8.30 ...	2	0
28	1.30 ...	16	0	8.30 ...	6	6	2.0 ...	14	0	9.0 ...	4	0
29	3.0 ...	13	9	10.0 ...	8	6	3.30 ...	12	9	11.0 ...	5	0
30	4.0 ...	12	6	11.0 ...	9	0	5.0 ...	11	0	11.45 ...	6	0

OCTOBER 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.45 A.M.	12	6	0.0 A.M.	0	0	0.0 P.M.	8	3	7.0 P.M.	11	0
2	1.0 ...	5	9	7.0 ...	12	6	1.0 ...	7	0	7.0 ...	11	3
3	1.0 ...	7	0	7.30 ...	13	0	2.30 ...	6	0	8.30 ...	12	9
4	2.0 ...	6	0	8.0 ...	14	0	2.30 ...	5	9	9.0 ...	13	3
5	3.0 ...	5	6	10.0 ...	14	6	3.45 ...	4	0	10.30 ...	14	6
6	4.0 ...	5	0	10.30 ...	15	0	4.30 ...	3	6	11.0 ...	14	9
7	5.0 ...	4	6	11.0 ...	15	0	5.0 ...	3	0	11.30 ...	15	6
8	4.30 ...	5	6	11.45 ...	15	0	5.30 ...	3	6	0.0 ...	0	0
9	0.0 ...	15	9	6.0 ...	5	9	0.30 ...	14	8	6.0 ...	3	6
10	0.15 ...	15	8	6.15 ...	6	3	1.0 ...	14	0	7.0 ...	3	9
11	1.0 ...	15	4	7.0 ...	6	9	1.30 ...	13	6	7.30 ...	4	0
12	1.30 ...	14	9	7.30 ...	7	0	2.0 ...	13	0	7.30 ...	5	0
13	2.15 ...	12	0	8.0 ...	7	6	2.30 ...	12	9	8.0 ...	5	6
14	2.30 ...	12	6	9.0 ...	8	6	3.0 ...	12	6	9.0 ...	5	6
15	3.30 ...	12	0	9.30 ...	8	6	3.45 ...	10	9	10.30 ...	6	0
16	4.0 ...	11	6	11.0 ...	9	0	4.30 ...	10	3	1.0 ...	7	0
17	5.30 ...	10	6	0.0 ...	0	0	1.0 ...	7	6	6.0 ...	12	3
18	1.15 ...	6	9	6.0 ...	10	9	1.15 ...	6	9	7.30 ...	11	9
19	2.0 ...	6	0	7.30 ...	13	6	2.30 ...	5	0	9.0 ...	13	3
20	3.0 ...	6	0	9.30 ...	14	6	3.0 ...	4	0	9.30 ...	14	6
21	4.0 ...	5	0	9.45 ...	15	3	4.0 ...	3	0	10.0 ...	15	9
22	4.30 ...	4	6	10.30 ...	16	0	4.30 ...	2	0	10.30 ...	16	9
23	5.0 ...	4	0	11.0 ...	16	0	6.0 ...	1	0	11.45 ...	17	6
24	6.30 ...	4	3	11.45 ...	16	6	5.0 ...	1	0	0.0 ...	0	0
25	0.0 ...	17	6	6.0 ...	4	6	0.15 ...	15	3	6.0 ...	1	6
26	0.30 ...	17	0	6 30 ...	5	0	1.0 ...	14	3	7.0 ...	2	0
27	1.0 ...	16	0	7.0 ...	7	0	2.0 ...	13	6	8.0 ...	3	0
28	2.0 ...	15	0	8.0 ...	7	6	2.30 ...	12	6	9.30 ...	4	0
29	3.30 ...	14	0	9.30 ...	8	3	4.30 ...	11	6	11.30 ...	6	0
30	5.0 ...	13	0	0.0 ...	0	0	0.0 ...	6	9	5.30 ...	10	9
31	0.30 ...	6	6	6.0 ...	12	6	1.0 ...	5	6	7.30 ...	11	3

NOVEMBER 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.0 A.M.	7	6	7.0 A.M.	11	9	1.30 P.M.	6	0	7.30 P.M.	12	0
2	2.0 ...	8	0	7.30 ...	12	9	2.0 ...	5	0	8.0 ...	13	0
3	2.30 ...	7	0	8.30 ...	13	3	3.0 ...	4	3	9.30 ...	13	9
4	3.30 ...	6	0	9.30 ...	13	9	3.30 ...	3	9	9.0 ...	14	6
5	3.30 ...	6	9	9.30 ...	14	0	4.0 ...	4	0	10.0 ...	15	0
6	6.0 ...	6	6	10.30 ...	14	0	6.0 ...	3	6	11.0 ...	15	3
7	6.30 ...	6	6	11.30 ...	13	9	7.0 ...	3	6	11.30 ...	15	9
8	7.0 ...	7	9	7.0 ...	0	0	0.0 ...	13	6	3.30 ...	7	0
9	1.0 ...	15	6	8.0 ...	7	6	1.0 ...	13	3	8.0 ...	3	9
10	1.0 ...	14	6	8.15 ...	7	0	1.15 ...	12	6	8.30 ...	4	0
11	1.30 ...	14	0	8.30 ...	7	3	1.30 ...	12	3	9.15 ...	4	6
12	2.0 ...	13	0	9.30 ...	7	6	2.15 ...	11	9	9.30 ...	5	6
13	2.30 ...	13	0	9.45 ...	8	0	2.30 ...	11	3	9.30 ...	6	9
14	3.0 ...	12	9	9.45 ...	7	6	3.30 ...	11	0	11.30 ...	7	0
15	4.0 ...	12	9	11.30 ...	7	6	4.30 ...	11	0	0.0 ...	0	0
16	0.30 ...	8	0	6.30 ...	13	0	1.0 ...	6	0	7.0 ...	12	6
17	1.30 ...	8	0	7.30 ...	14	0	2.0 ...	5	0	8.0 ...	13	9
18	2.0 ...	7	0	8.30 ...	14	3	2.30 ...	4	0	9.15 ...	15	3
19	2.15 ...	8	0	9.30 ...	14	9	3.30 ...	4	0	9.45 ...	16	3
20	4.0 ...	7	0	10.0 ...	15	0	4.0 ...	2	0	10.0 ...	16	9
21	4.30 ...	5	0	10.30 ...	15	0	5.30 ...	1	0	11.45 ...	17	0
22	6.0 ...	6	9	0.0 ...	0	0	0.0 ...	15	0	6.0 ...	1	0
23	1.0 ...	17	3	1.0 ...	5	0	1.0 ...	14	6	6.30 ...	1	0
24	1.15 ...	16	9	7.0 ...	5	6	1.15 ...	13	6	7.30 ...	1	6
25	1.30 ...	16	0	8.0 ...	6	0	1.30 ...	13	6	8.30 ...	4	0
26	2.0 ...	15	3	9.0 ...	6	6	2.30 ...	13	3	9.0 ...	4	0
27	3.0 ...	14	0	9.15 ...	6	6	3.0 ...	12	0	9.30 ...	5	0
28	3.15 ...	13	6	10.0 ...	6	3	3.30 ...	11	0	10.30 ...	6	0
29	4.0 ...	13	0	11.0 ...	6	0	5.0 ...	10	9	11.0 ...	6	6
30	5.0 ...	12	9	0.0 ...	0	0	0.0 ...	5	6	6.0 ...	12	0

DECEMBER 1839.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.0 A.M.	8	0	6.30 A.M.	12	3	1.30 P.M.	5	6	7.0 P.M.	12	3
2	1.30 ...	7	6	7.30 ...	12	6	2.0 ...	5	0	9.0 ...	13	6
3	2.15 ...	7	0	9.0 ...	12	9	3.0 ...	4	0	9.15 ...	14	0
4	3.15 ...	8	0	9.45 ...	13	0	3.30 ...	4	0	10.0 ...	14	6
5	3.30 ...	7	6	10.15 ...	13	6	4.0 ...	3	9	10.45 ...	15	3
6	3.45 ...	7	6	11.0 ...	13	0	4.15 ...	3	9	11.15 ...	15	3
7	4.30 ...	7	9	11.30 ...	13	3	6.30 ...	7	6	0.0 ...	0	0
8	0.30 ...	15	6	7.0 ...	3	9	0.30 ...	13	6	7.30 ...	6	9
9	1.0 ...	15	3	8.0 ...	3	9	7.0 ...	13	3	7.0 ...	4	0
10	1.15 ...	15	0	7.30 ...	7	0	1.30 ...	13	0	9.0 ...	4	9
11	2.0 ...	14	0	8.30 ...	7	6	2.30 ...	13	0	9.0 ...	4	6
12	2.30 ...	14	0	9.30 ...	5	9	2.45 ...	12	6	10.0 ...	5	0
13	3.0 ...	13	6	10.30 ...	6	0	3.0 ...	12	0	10.15 ...	6	9
14	4.0 ...	14	0	10.30 ...	8	6	4.15 ...	11	6	11.30 ...	7	0
15	6.0 ...	14	0	11.45 ...	5	6	6.30 ...	11	6	0.0 ...	0	0
16	0.30 ...	7	0	7.0 ...	14	0	1.0 ...	5	0	7.30 ...	14	3
17	1.30 ...	7	3	8.0 ...	13	9	2.0 ...	4	6	8.30 ...	14	9
18	1.45 ...	7	6	8.45 ...	13	9	2.30 ...	3	6	9.30 ...	16	3
19	3.30 ...	7	6	9.45 ...	14	3	4.0 ...	2	6	10.30 ...	16	9
20	4.0 ...	7	6	10.30 ...	14	6	4.30 ...	2	0	11.30 ...	17	3
21	5.0 ...	6	6	11.45 ...	15	0	5.30 ...	1	0	0.0 ...	0	0
22	0.0 ...	17	9	6.0 ...	6	0	0.0 ...	15	3	6.15 ...	1	0
23	1.0 ...	17	9	6.30 ...	5	9	1.0 ...	15	3	7.0 ...	3	0
24	1.45 ...	17	6	8.0 ...	6	0	2.0 ...	14	6	8.30 ...	2	6
25	2.30 ...	16	9	9.30 ...	5	6	2.30 ...	14	0	9.30 ...	3	0
26	3.0 ...	16	0	10.0 ...	5	6	3.0 ...	13	3	10.0 ...	7	9
27	4.0 ...	15	6	10.30 ...	4	0	4.30 ...	12	0	10.30 ...	7	0
28	4.30 ...	13	6	11.0 ...	6	6	4.45 ...	10	9	11.30 ...	6	9
29	5.0 ...	12	9	11.45 ...	7	0	5.30 ...	10	6	0.0 ...	0	0
30	0.30 ...	6	6	6.0 ...	12	3	0.15 ...	5	6	6.0 ...	10	6
31	1.0 ...	7	6	6.30 ...	11	6	2.0 ...	5	0	8.0 ...	13	0

JANUARY 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.15 A.M.	7	6	8.30 A.M.	11	0	2.0 P.M.	5	0	9.0 P.M.	13	6
2	2.45 ...	7	0	9.0 ...	11	6	2.30 ...	4	0	9.30 ...	14	0
3	4.0 ...	6	9	10.0 ...	12	0	3.30 ...	3	6	10.30 ...	15	0
4	3.0 ...	6	9	10.45 ...	13	0	4.15 ...	3	6	11.0 ...	14	9
5	5.0 ...	7	6	11.30 ...	13	0	5.30 ...	3	6	11.45 ...	15	9
6	6.0 ...	6	9	0.0 ...	0	0	0.30 ...	13	6	6.30 ...	2	9
7	0.30 ...	16	0	6.30 ...	5	9	1.0 ...	13	9	6.45 ...	3	6
8	1.15 ...	16	0	6.45 ...	6	0	1.30 ...	14	0	7.15 ...	4	0
9	1.30 ...	15	9	7.15 ...	5	9	1.45 ...	13	6	7.30 ...	5	6
10	2.30 ...	15	6	8.0 ...	4	9	3.0 ...	13	3	9.0 ...	5	0
11	3.0 ...	15	0	9.0 ...	4	6	3.15 ...	12	9	10.0 ...	6	0
12	4.0 ...	14	0	10.30 ...	5	6	4.30 ...	12	6	11.0 ...	7	0
13	4.30 ...	13	0	11.30 ...	6	0	5.0 ...	12	6	11.30 ...	8	0
14	5.0 ...	12	9	11.45 ...	6	0	6.30 ...	13	0	0.0 ...	0	0
15	0.30 ...	8	6	7.0 ...	12	6	1.0 ...	4	0	7.0 ...	12	9
16	2.0 ...	7	0	8.0 ...	13	9	3.0 ...	3	6	8.30 ...	15	6
17	2.30 ...	8	6	9.0 ...	13	6	3.30 ...	2	0	9.30 ...	16	6
18	3.0 ...	7	0	10.0 ...	14	6	4.0 ...	2	0	10.30 ...	17	0
19	4.30 ...	5	6	11.0 ...	15	3	5.15 ...	2	0	11.30 ...	17	6
20	5.30 ...	4	9	11.30 ...	15	6	6.0 ...	2	0	0.0 ...	0	0
21	0.30 ...	17	9	7.0 ...	4	6	1.0 ...	15	6	7.0 ...	2	0
22	1.0 ...	17	9	7.15 ...	4	6	1.15 ...	15	3	8.0 ...	4	0
23	2.0 ...	16	0	8.30 ...	5	0	3.0 ...	13	6	8.45 ...	5	6
24	3.0 ...	15	0	9.30 ...	5	0	3.15 ...	13	0	9.30 ...	6	0
25	3.30 ...	14	0	10.0 ...	5	0	3.30 ...	12	0	10.30 ...	6	6
26	4.0 ...	13	6	10.30 ...	5	6	4.0 ...	11	6	11.0 ...	7	0
27	4.30 ...	12	6	11.0 ...	6	0	4.30 ...	11	3	11.30 ...	8	0
28	5.0 ...	12	0	11.45 ...	6	6	5.0 ...	11	0	0.0 ...	0	0
29	0.15 ...	8	0	6.0 ...	11	0	0.30 ...	5	6	6.30 ...	11	0
30	0.45 ...	8	6	7.0 ...	11	0	1.0 ...	5	0	7.30 ...	12	6
31	2.0 ...	7	9	8.0 ...	11	3	2.30 ...	4	9	8.30 ...	13	3

FEBRUARY 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.0 A.M.	7	0	8.30 A.M.	12	0	3.30 P.M.	4	0	10.0 P.M.	14	3
2	3.30 ...	6	9	10.0 ...	12	9	4.0 ...	3	0	11.0 ...	15	6
3	4.0 ...	6	6	10.30 ...	13	3	4.30 ...	5	0	11.30 ...	16	0
4	5.30 ...	5	0	11.45 ...	14	0	5.45 ...	4	6	0.0 ...	0	0
5	0.45 ...	16	6	6.0 ...	5	0	0.30 ...	14	6	6.30 ...	2	6
6	1.15 ...	16	6	7.0 ...	4	0	1.45 ...	15	0	7.30 ...	3	0
7	2.0 ...	15	9	7.30 ...	4	6	2.30 ...	13	9	9.0 ...	4	0
8	2.30 ...	15	6	9.30 ...	3	6	2.30 ...	14	6	9.30 ...	5	0
9	3.0 ...	15	0	10.0 ...	3	6	3.0 ...	14	0	10.30 ...	6	0
10	3.30 ...	14	6	10.30 ...	4	0	3.30 ...	13	0	11.0 ...	7	0
11	4.0 ...	13	6	11.0 ...	5	6	4.30 ...	12	6	11.30 ...	6	9
12	4.30 ...	13	3	11.30 ...	5	0	7.0 ...	13	0	0.0 ...	0	0
13	1.0 ...	7	0	6.0 ...	12	3	1.0 ...	6	0	7.0 ...	13	9
14	1.30 ...	7	6	7.30 ...	12	6	2.0 ...	5	0	8.30 ...	12	9
15	2.0 ...	7	6	8.30 ...	12	9	4.0 ...	4	6	10.30 ...	15	0
16	5.30 ...	6	9	11.0 ...	14	0	3.0 ...	5	0	11.0 ...	16	6
17	6.0 ...	6	6	11.45 ...	14	6	5.45 ...	2	6	11.45 ...	17	0
18	6.30 ...	4	0	0.0 ...	0	0	0.15 ...	15	3	6.30 ...	2	0
19	0.30 ...	17	3	6.45 ...	3	9	1.0 ...	15	3	7.0 ...	2	6
20	1.0 ...	17	0	7.15 ...	3	6	1.30 ...	15	0	7.30 ...	3	0
21	2.30 ...	16	0	7.30 ...	4	0	2.30 ...	15	3	8.0 ...	5	6
22	3.0 ...	15	6	8.30 ...	4	6	3.0 ...	14	3	8.15 ...	6	0
23	3.30 ...	14	6	8.45 ...	4	6	3.30 ...	13	6	8.45 ...	6	6
24	4.0 ...	13	6	9.0 ...	5	0	4.0 ...	12	3	8.30 ...	7	0
25	4.15 ...	12	9	9.0 ...	4	9	4.30 ...	11	9	10.0 ...	7	6
26	5.0 ...	12	0	11.0 ...	6	0	5.0 ...	11	3	11.0 ...	9	0
27	6.0 ...	12	3	0.0 ...	0	0	0.0 ...	6	0	6.0 ...	11	0
28	0.30 ...	18	6	6.30 ...	10	6	1.0 ...	6	6	8.0 ...	12	6
29	1.0 ...	7	6	8.30 ...	11	3	2.0 ...	4	0	8.30 ...	13	3

MARCH 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.15 A.M.	6	6	8.30 A.M.	12	0	2.30 P.M.	5	0	9.0 P.M.	14	3
2	2.45 ...	5	6	9.0 ...	13	0	3.0 ...	4	6	10.0 ...	15	3
3	3.30 ...	5	0	10.0 ...	14	0	3.30 ...	4	0	11.0 ...	16	0
4	5.0 ...	3	6	11.30 ...	15	6	5.0 ...	3	0	0.0 ...	0	0
5	0.15 ...	16	6	6.0 ...	3	6	1.0 ...	16	0	3.45 ...	3	9
6	1.0 ...	16	9	7.0 ...	3	0	1.15 ...	16	0	7.0 ...	4	0
7	2.0 ...	16	9	8.0 ...	2	6	2.15 ...	16	0	9.30 ...	3	6
8	2.30 ...	15	0	9.30 ...	3	0	3.0 ...	15	9	10.0 ...	4	0
9	3.0 ...	15	6	10.30 ...	3	6	3.15 ...	14	6	10.30 ...	6	0
10	3.30 ...	14	6	11.0 ...	4	0	4.30 ...	14	3	10.45 ...	6	0
11	3.45 ...	13	0	11.15 ...	5	0	4.45 ...	13	0	11.0 ...	6	6
12	4 30 ...	12	9	11.30 ...	5	6	5.0 ...	12	6	11.30 ...	7	0
13	5.30 ...	12	3	11.45 ...	6	6	7.0 ...	13	0	0.0 ...	0	0
14	1.30 ...	6	6	7.30 ...	13	0	2.0 ...	5	6	8.30 ...	14	0
15	2.30 ...	6	0	8.30 ...	13	6	2.30 ...	5	0	9.0 ...	15	0
16	2.45 ...	5	0	9.30 ...	14	0	3.0 ...	4	6	9.30 ...	15	9
17	3.30 ...	4	6	10.0 ...	14	6	4.0 ...	4	6	10.30 ...	16	9
18	4.30 ...	4	3	11.0 ...	15	0	4.30 ...	4	0	11.30 ...	17	0
19	5.30 ...	4	0	0.0 ...	0	0	0.15 ...	15	9	6.0 ...	5	6
20	0.30 ...	17	0	6.30 ...	3	0	1.0 ...	15	9	6.30 ...	5	6
21	1.0 ...	16	6	7.0 ...	3	0	1.30 ...	15	6	7.0 ...	6	0
22	1.15 ...	15	6	8.0 ...	4	0	1.45 ...	15	0	8.0 ...	7	0
23	2.0 ...	14	9	8.30 ...	4	6	2.0 ...	14	6	8.15 ...	7	0
24	2.15 ...	14	0	8.30 ...	5	6	2.30 ...	13	0	9.30 ...	7	9
25	3.30 ...	13	0	9,45 ...	6	0	4.0 ...	12	6	10.0 ...	9	0
26	4.15 ...	12	9	10.30 ...	7	0	4.45 ...	12	3	11.15 ...	9	0
27	4.30 ...	11	0	11.30 ...	7	6	5.0 ...	11	6	11.30 ...	9	3
28	5.30 ...	10	9	11.45 ...	8	0	7.30 ...	12	6	0.0 ...	0	0
29	2.0 ...	8	0	8.0 ...	11	0	2.15 ...	6	0	8.30 ...	13	6
30	2.30 ...	7	9	9,0 ...	12	6	2.45 ...	5	6	9.45 ...	14	9
31	3.0 ...	6	9	9.45 ...	13	9	3.30 ...	5	0	10.45 ...	15	6

APRIL 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.0 A.M.	4	0	11.0 A.M.	15	6	4.30 P.M.	4	9	11.30 P.M.	16	0
2	5.0 ...	2	6	11.30 ...	15	9	5.0 ...	4	6	11.45 ...	16	0
3	5.30 ...	1	0	0.0 ...	0	0	0.15 ...	16	6	6.0 ...	4	6
4	1.30 ...	16	9	6.45 ...	1	0	1.0 ...	16	9	6.30 ...	4	6
5	1.15 ...	16	3	7.0 ...	1	0	1.30 ...	17	0	7.0 ...	5	0
6	1.30 ...	15	9	7.30 ...	1	0	1.45 ...	16	6	8.0 ...	5	6
7	2.0 ...	15	6	7.45 ...	2	0	2.0 ...	15	9	8.30 ...	7	0
8	2.15 ...	15	6	8.30 ...	1	6	2.30 ...	15	0	9.0 ...	8	0
9	3.0 ...	15	0	9.30 ...	3	0	3.30 ...	14	6	10.30 ...	8	6
10	4.0 ...	14	0	11.0 ...	5	0	4.30 ...	13	0	11.30 ...	9	0
11	5.30 ...	13	6	11.45 ...	5	6	7.0 ...	13	6	0.0 ...	0	0
12	1.0 ...	8	0	7.30 ...	12	6	1.30 ...	6	6	8.0 ...	14	3
13	2.0 ...	7	0	8.0 ...	13	3	2.0 ...	6	0	8.30 ...	14	9
14	3.30 ...	6	0	8.30 ...	14	9	3.0 ...	6	6	9.0 ...	15	6
15	4.0 ...	5	0	9.30 ...	15	6	4.0 ...	6	0	10.0 ...	15	9
16	4.30 ...	4	0	11.0 ...	15	9	5.0 ...	6	6	11.30 ...	16	6
17	5.0 ...	3	0	0.0 ...	0	0	0.15 ...	16	3	6.0 ...	6	9
18	0.30 ...	16	3	6.30 ...	3	6	0.45 ...	16	0	6.45 ...	6	6
19	0.45 ...	15	9	6.45 ...	3	6	1.0 ...	15	0	7.0 ...	7	0
20	1.15 ...	14	9	7.30 ...	4	0	1.45 ...	14	6	8.0 ...	7	6
21	2.0 ...	14	6	8.30 ...	4	0	2.0 ...	14	3	9.15 ...	7	9
22	2.30 ...	13	9	9.30 ...	5	6	2.30 ...	14	6	10.0 ...	8	0
23	3.0 ...	13	6	10.30 ...	5	6	3.0 ...	14	0	10.0 ...	9	0
24	3.30 ...	12	9	10.45 ...	7	0	4.0 ...	13	6	11.15 ...	9	6
25	4.30 ...	13	0	11.15 ...	7	0	5.0 ...	12	6	11.30 ...	7	0
26	5.0 ...	12	0	11.30 ...	8	0	5.30 ...	11	9	12.0 ...	6	9
27	6.0 ...	11	9	12.0 ...	0	0	0.0 ...	7	0	7.0 ...	13	6
28	1.0 ...	5	6	7.30 ...	13	9	1.30 ...	6	6	8.0 ...	14	3
29	2.0 ...	4	6	8.0 ...	14	0	2.30 ...	6	0	9.30 ...	15	0
30	2.0 ...	3	6	10.0 ...	15	3	2.0 ...	5	6	10.0 ...	15	3

MAY 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.30 A.M.	2	6	10.30 A.M.	16	3	3.45 P.M.	4	6	11.0 P.M.	16	0
2	5.0 ...	1	0	11.0 ...	17	6	5.0 ...	5	6	11.30 ...	16	0
3	6.0 ...	1	0	0.0 ...	0	0	0.15 ...	17	3	6.30 ...	6	0
4	0.30 ...	15	0	6.30 ...	1	6	1.0 ...	16	0	6.0 ...	6	6
5	1.0 ...	15	9	7.0 ...	1	0	1.30 ...	16	9	8.0 ...	6	3
6	2.0 ...	15	0	8.30 ...	1	3	2.30 ...	15	9	8.30 ...	6	6
7	2.30 ...	15	6	8.45 ...	3	3	3.0 ...	14	6	9.0 ...	7	0
8	3.45 ...	15	0	9.30 ...	5	6	4.30 ...	14	3	10.0 ...	7	6
9	4.0 ...	12	0	10.15 ...	6	6	4.0 ...	13	3	11.30 ...	7	3
10	5.30 ...	12	6	0.0 ...	0	0	0.0 ...	6	3	6.0 ...	12	9
11	0.0 ...	6	9	7.0 ...	12	3	1.30 ...	6	6	7.30 ...	12	6
12	2.0 ...	6	0	8.0 ...	13	0	2.15 ...	6	9	8.0 ...	13	0
13	2.15 ...	4	0	8.30 ...	13	9	2.30 ...	7	6	8.15 ...	13	9
14	2.30 ...	4	0	9.0 ...	14	9	3.0 ...	6	0	10.0 ...	14	0
15	4.0 ...	3	6	10.30 ...	15	3	4.0 ...	7	9	11.0 ...	14	3
16	4.0 ...	4	0	11.0 ...	15	6	4.30 ...	7	9	11.30 ...	14	0
17	4.30 ...	4	0	0.0 ...	0	0	0.15 ...	15	9	6.0 ...	7	6
18	0.30 ...	14	0	6.0 ...	3	6	0.30 ...	15	3	6.15 ...	7	6
19	1.0 ...	13	3	6.30 ...	4	0	1.0 ...	14	9	6.45 ...	7	6
20	1.30 ...	13	0	7.0 ...	4	0	1.30 ...	14	3	8.30 ...	9	0
21	1.30 ...	12	6	9.0 ...	4	0	2.0 ...	14	3	9.0 ...	8	6
22	2.30 ...	12	6	9.30 ...	4	6	2.30 ...	13	6	10.0 ...	8	9
23	3.0 ...	12	0	10.30 ...	5	0	3.30 ...	13	6	10.0 ...	9	0
24	3.30 ...	12	0	10.0 ...	6	6	3.45 ...	13	9	11.0 ...	9	6
25	4.0 ...	11	9	11.30 ...	7	0	4.15 ...	13	6	11.30 ...	9	9
26	4.30 ...	11	6	0.0 ...	0	0	0.15 ...	9	9	5.0 ...	13	6
27	0.30 ...	5	6	6.30 ...	13	0	1.0 ...	7	6	7.30 ...	14	9
28	3.0 ...	2	0	9.0 ...	16	6	3.0 ...	6	6	9.30 ...	15	0
29	4.0 ...	1	6	10.30 ...	16	9	4.0 ...	7	0	9.45 ...	15	3
30	4.15 ...	1	3	10.45 ...	16	9	4.30 ...	7	3	10.30 ...	15	3
31	4.30 ...	1	3	11.0 ...	17	3	5.30 ...	1	0	11.30 ...	17	6

JUNE 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	5.30 A.M.	1	0	11.30 A.M.	17	6	6.0 P.M.	6	0	0.0 P.M.	0	0
2	0.15 ...	15	0	6.0 ...	1	0	0.30 ...	17	3	6.30 ...	5	9
3	1.0 ...	15	0	6.45 ...	2	0	1.15 ...	16	9	7.0 ...	5	6
4	1.45 ...	14	9	7.30 ...	3	0	2.0 ...	16	6	9.0 ...	8	9
5	3.0 ...	12	3	8.30 ...	5	0	2.30 ...	15	0	9.15 ...	0	0
6	3.30 ...	12	3	9.30 ...	6	3	3.30 ...	14	9	10.0 ...	7	6
7	4.0 ...	13	0	10.0 ...	8	0	5.0 ...	13	9	11.15 ...	6	6
8	6.0 ...	12	0	11.45 ...	8	0	5.30 ...	13	6	0.0 ...	0	0
9	0.30 ...	6	6	6.0 ...	12	6	1.0 ...	8	6	8.0 ...	13	0
10	1.45 ...	7	6	7.30 ...	12	0	2.0 ...	8	9	8.15 ...	13	9
11	2.15 ...	5	0	8.30 ...	14	0	2.30 ...	8	0	8.30 ...	14	0
12	3.0 ...	5	0	9.0 ...	14	3	3.30 ...	7	9	10.0 ...	14	3
13	3.15 ...	4	6	9.30 ...	15	3	3.45 ...	9	6	10.30 ...	14	0
14	3.0 ...	4	6	10.30 ...	15	9	4.0 ...	9	3	11.0 ...	14	0
15	3.45 ...	4	0	11.30 ...	16	0	4.15 ...	9	0	11.45 ...	14	0
16	5.0 ...	4	6	0.0 ...	0	0	0.15 ...	16	3	5.30 ...	8	9
17	0.30 ...	14	0	6.0 ...	4	0	1.0 ...	15	9	6.30 ...	8	6
18	1.0 ...	14	0	6.30 ...	4	0	1.30 ...	15	9	7.0 ...	7	6
19	2.0 ...	13	9	7.15 ...	5	0	2.15 ...	15	0	7.30 ...	7	9
20	2.30 ...	13	6	8.0 ...	5	3	3.0 ...	14	9	8.30 ...	7	9
21	3.0 ...	13	0	8.45 ...	5	6	3.30 ...	14	0	9.0 ...	8	0
22	3.30 ...	12	9	9.30 ...	6	0	3.45 ...	13	6	10.0 ...	6	6
23	5.0 ...	12	6	11.0 ...	8	0	4.0 ...	13	0	11.0 ...	6	0
24	5.15 ...	12	0	11.30 ...	8	0	5.30 ...	12	6	0.0 ...	0	0
25	1.0 ...	7	6	6.0 ...	12	3	1.0 ...	9	3	7.0 ...	12	9
26	1.30 ...	4	0	7.30 ...	14	9	1.30 ...	8	0	8.0 ...	13	3
27	2.0 ...	3	9	8.15 ...	15	3	2.30 ...	7	9	9.0 ...	13	9
28	4.0 ...	3	6	10.0 ...	16	0	4.0 ...	7	6	10.30 ...	14	0
29	4.30 ...	2	0	11.0 ...	16	6	5.0 ...	7	0	11.0 ...	14	3
30	5.0 ...	1	0	0.0 ...	0	0	0.0 ...	16	9	5.45 ...	6	3

JULY 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	0.15 A.M.	14	3	6.0 A.M.	1	0	0.30 P.M.	16	9	6.30 P.M.	5	0
2	1.0 ...	14	0	6.30 ...	1	6	1.0 ...	16	6	7.30 ...	4	9
3	1.30 ...	14	0	7.45 ...	2	0	2.0 ...	16	3	8.0 ...	5	6
4	1.45 ...	13	6	8.30 ...	3	0	2.15 ...	15	9	8.0 ...	5	6
5	2.30 ...	12	9	8.30 ...	5	6	3.0 ...	14	6	9.0 ...	6	0
6	3.0 ...	12	3	9.0 ...	7	0	4.0 ...	13	0	11.0 ...	7	0
7	5.0 ...	12	0	11.30 ...	7	0	6.30 ...	12	6	0.15 ...	0	0
8	6.0 ...	7	6	6.30 ...	11	9	1.0 ...	8	0	7.0 ...	11	9
9	1.0 ...	6	0	8.0 ...	12	3	1.30 ...	8	6	8.0 ...	12	0
10	2.0 ...	7	6	8.30 ...	12	9	2.30 ...	5	0	8.30 ...	12	0
11	2.45 ...	6	6	9.0 ...	13	3	3.0 ...	7	6	8.45 ...	12	0
12	3.0 ...	5	0	9.15 ...	13	3	3.30 ...	6	9	9.0 ...	12	6
13	3.30 ...	4	9	9.30 ...	14	9	4.0 ...	7	0	11.0 ...	13	0
14	4.45 ...	4	9	11.0 ...	15	0	4.30 ...	7	6	11.30 ...	13	3
15	4.45 ...	4	0	11.45 ...	15	3	5.0 ...	7	0	11.45 ...	13	3
16	5.30 ...	3	6	0.0 ...	0	0	0.15 ...	15	6	6.0 ...	6	9
17	0.30 ...	13	6	6.30 ...	3	6	1.0 ...	15	9	6.30 ...	6	6
18	1.30 ...	13	6	6.45 ...	4	0	1.45 ...	15	9	7.0 ...	6	6
19	1.45 ...	13	0	7.15 ...	5	0	2.0 ...	15	6	8.0 ...	5	6
20	2.15 ...	12	9	8.15 ...	5	6	2.30 ...	15	0	9.0 ...	5	6
21	3.0 ...	12	6	9.30 ...	6	6	3.30 ...	14	6	9.30 ...	5	6
22	4.0 ...	12	6	10.0 ...	7	0	4.30 ...	14	0	10.30 ...	5	3
23	5.0 ...	12	3	11.0 ...	7	6	4.45 ...	13	9	11.0 ...	4	6
24	6.0 ...	13	6	0.0 ...	0	0	0.15 ...	8	0	7.0 ...	12	3
25	1.0 ...	4	9	7.30 ...	14	3	1.30 ...	7	6	8.0 ...	12	6
26	2.0 ...	4	6	8.0 ...	15	0	2.0 ...	7	0	9.0 ...	12	9
27	3.0 ...	4	6	9.30 ...	15	6	3.0 ...	6	9	10.0 ...	13	0
28	3.30 ...	3	0	10.30 ...	16	0	3.30 ...	6	6	11.0 ...	14	6
29	4.0 ...	2	0	11.30 ...	16	9	4.0 ...	6	0	11.30 ...	14	9
30	5.0 ...	2	6	0.0 ...	0	0	0.15 ...	17	0	5.45 ...	5	0
31	1.0 ...	15	6	6.0 ...	2	6	1.0 ...	17	0	6.0 ...	4	6

AUGUST 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	1.0 A.M.	16	0	6.0 A.M.	3	6	1.30 P.M.	16	6	7.0 P.M.	5	0
2	1.45 ...	15	0	8.0 ...	4	6	2.0 ...	15	0	8.30 ...	6	0
3	2.30 ...	14	0	9.0 ...	7	0	3.0 ...	14	6	9.0 ...	6	0
4	3.0 ...	14	6	10.0 ...	7	6	3.30 ...	14	0	10.0 ...	6	0
5	3.30 ...	13	0	11.0 ...	8	6	4.0 ...	13	0	10.30 ...	9	0
6	3.45 ...	12	6	11.15 ...	7	6	5.0 ...	12	9	11.0 ...	6	9
7	5.0 ...	12	0	11.30 ...	8	6	6.0 ...	12	3	0.0 ...	0	0
8	0.15 ...	7	0	7.0 ...	12	0	1.0 ...	9	0	8.0 ...	12	3
9	1.30 ...	7	0	8.0 ...	13	0	2.0 ...	9	0	9.0 ...	12	6
10	2.0 ...	6	9	9.30 ...	13	6	2.30 ...	9	6	10.0 ...	12	9
11	3.0 ...	7	0	10.30 ...	14	0	3.0 ...	9	0	11.15 ...	13	0
12	3.30 ...	5	0	11.30 ...	15	0	4.0 ...	7	0	11.30 ...	13	6
13	4.30 ...	4	0	11.45 ...	15	6	5.30 ...	6	0	11.45 ...	13	9
14	6.0 ...	3	6	0.0 ...	0	0	0.15 ...	15	9	6.30 ...	4	6
15	1.0 ...	14	6	6.30 ...	3	0	1.0 ...	15	6	7.0 ...	4	0
16	1.30 ...	14	9	7.0 ...	4	0	1.30 ...	14	9	7.30 ...	4	0
17	1.45 ...	14	9	7.30 ...	3	6	2.0 ...	14	9	8.0 ...	4	0
18	2.15 ...	14	6	8.0 ...	4	0	2.30 ...	14	3	8.45 ...	5	0
19	2.45 ...	14	3	9.0 ...	4	6	3.0 ...	14	0	9.30 ...	6	0
20	3.30 ...	13	9	10.0 ...	5	0	3.30 ...	13	6	10.0 ...	6	6
21	3.0 ...	13	0	10.30 ...	5	6	4.30 ...	12	0	11.0 ...	6	0
22	4.30 ...	12	0	11.30 ...	8	0	6.0 ...	12	0	0.0 ...	0	0
23	0.15 ...	7	3	6.30 ...	13	0	1.0 ...	8	6	7.30 ...	12	3
24	1.30 ...	7	0	8.0 ...	14	0	2.30 ...	8	0	8.30 ...	13	0
25	3.0 ...	4	6	9.30 ...	15	0	4.0 ...	6	0	9.30 ...	14	0
26	4.0 ...	3	6	10.0 ...	16	0	4.30 ...	4	0	10.30 ...	14	6
27	5.0 ...	2	6	11.0 ...	16	6	5.0 ...	3	6	11.30 ...	15	3
28	5.30 ...	2	6	11.45 ...	16	3	6.0 ...	3	0	0.0 ...	0	0
29	0.15 ...	15	6	6.15 ...	3	0	0.30 ...	16	3	7.0 ...	3	6
30	0.30 ...	15	6	7.30 ...	3	0	1.0 ...	15	6	7.30 ...	4	6
31	2.0 ...	15	3	8.0 ...	3	6	2.0 ...	14	6	8.0 ...	5	0

SEPTEMBER 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.15 A.M.	14	0	8.30 A.M.	6	0	2.30 P.M.	14	3	8.30 P.M.	5	6
2	2.30 ...	13	3	8.0 ...	7	6	2.45 ...	13	6	9.0 ...	6	0
3	3.0 ...	12	9	9.30 ...	7	6	3.30 ...	12	0	10.0 ...	6	6
4	3.45 ...	12	0	10.30 ...	8	6	4.0 ...	11	9	10.30 ...	6	6
5	4.30 ...	11	9	11.0 ...	8	0	4.30 ...	11	6	11.0 ...	7	0
6	5.30 ...	11	9	11.45 ...	8	6	6.30 ...	12	0	0.0 ...	0	0
7	0.15 ...	7	3	7.30 ...	12	3	1.0 ...	8	6	8.0 ...	12	0
8	2.0 ...	7	6	8.30 ...	13	3	2.30 ...	7	0	9.0 ...	12	6
9	3.0 ...	7	0	9.0 ...	14	0	3.0 ...	6	0	9.45 ...	13	0
10	3.30 ...	4	0	10.0 ...	15	0	4.0 ...	6	0	10.30 ...	14	3
11	4.0 ...	3	6	11.0 ...	15	3	4.30 ...	5	0	11.0 ...	15	0
12	5.0 ...	4	0	11.30 ...	16	3	5.0 ...	5	9	11.15 ...	16	0
13	5.30 ...	3	6	11.45 ...	16	3	5.30 ...	5	0	0.0 ...	0	0
14	0.15 ...	16	0	6.0 ...	3	6	1.0 ...	16	3	6.30 ...	3	0
15	1.30 ...	16	0	6.45 ...	5	0	1.30 ...	15	6	7.0 ...	3	0
16	1.45 ...	15	3	7.0 ...	6	0	2.0 ...	14	6	7.30 ...	3	6
17	2.30 ...	14	6	8.0 ...	7	0	2.45 ...	14	0	8.0 ...	4	0
18	3.30 ...	13	0	9.0 ...	7	0	3.30 ...	13	6	10.0 ...	4	6
19	4.0 ...	13	0	9.45 ...	8	0	4.0 ...	12	9	11.0 ...	6	0
20	5.0 ...	11	9	11.30 ...	8	6	6.0 ...	12	0	0.0 ...	0	0
21	0.15 ...	6	6	6.30 ...	12	0	1.0 ...	8	9	8.0 ...	12	0
22	1.30 ...	7	0	8.0 ...	13	9	2.0 ...	6	6	8.30 ...	14	3
23	3.0 ...	4	6	8.45 ...	13	3	3.45 ...	5	0	9.30 ...	14	6
24	4.0 ...	5	6	10.0 ...	15	6	4.30 ...	5	0	10.0 ...	15	6
25	4.30 ...	4	0	11.0 ...	15	9	5.0 ...	4	6	11.30 ...	15	9
26	5.0 ...	3	6	11.30 ...	16	0	5.30 ...	4	6	11.45 ...	16	0
27	6.0 ...	4	0	11.45 ...	16	0	6.0 ...	4	6	0.0 ...	0	0
28	0.15 ...	15	9	6.30 ...	5	0	0.30 ...	15	6	5.30 ...	3	6
29	1.0 ...	15	0	5.30 ...	6	0	1.30 ...	14	0	7.0 ...	3	0
30	1.30 ...	13	6	7.0 ...	7	0	2.0 ...	13	0	7.45 ...	5	0

OCTOBER 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	2.30 A.M.	12	6	8.0 A.M.	8	0	2.30 P.M.	11	9	8.0 P.M.	5	6
2	3.0 ...	11	6	8.45 ...	8	6	3.0 ...	11	6	9.0 ...	6	3
3	3.30 ...	12	3	9.30 ...	8	6	3.30 ...	10	6	10.0 ...	6	6
4	4.0 ...	11	6	11.0 ...	8	6	4.30 ...	10	6	11.25 ...	7	0
5	5.30 ...	11	9	11.30 ...	8	0	6.0 ...	11	0	0.0 ...	0	0
6	0.15 ...	7	6	6.30 ...	12	0	1.0 ...	7	6	8.0 ...	11	9
7	1.0 ...	6	0	8.30 ...	12	9	2.30 ...	5	0	9.0 ...	12	3
8	3.0 ...	4	6	9.0 ...	13	9	3.30 ...	5	0	9.0 ...	13	6
9	4.0 ...	5	0	9.30 ...	14	6	4.0 ...	3	6	10.0 ...	14	3
10	4.15 ...	5	0	10.0 ...	15	3	4.30 ...	3	0	11.0 ...	15	3
11	4.30 ...	4	0	11.15 ...	15	3	5.0 ...	2	6	11.30 ...	16	0
12	5.0 ...	4	0	11.30 ...	15	6	5.30 ...	2	0	11.45 ...	16	6
13	6.0 ...	4	6	0.0 ...	0	0	0.30 ...	15	6	6.30 ...	1	6
14	1.0 ...	16	9	6.30 ...	5	0	1.30 ...	15	3	6.45 ...	1	6
15	1.15 ...	16	6	6.45 ...	6	6	1.30 ...	14	6	8.0 ...	2	6
16	1.30 ...	15	0	8.30 ...	6	0	1.45 ...	13	6	8.45 ...	3	0
17	2.0 ...	14	6	9.0 ...	6	6	2.15 ...	13	0	9.30 ...	3	6
18	3.0 ...	14	0	10.0 ...	7	0	3.0 ...	12	6	11.0 ...	4	0
19	3.45 ...	13	6	11.0 ...	7	3	3.30 ...	12	0	11.30 ...	5	0
20	5.0 ...	13	0	0 0 ...	0	0	0.15 ...	6	9	6.0 ...	12	3
21	1.30 ...	6	0	7.30 ...	14	0	2.0 ...	5	6	9.30 ...	14	0
22	2.0 ...	7	0	9.0 ...	13	6	2.30 ...	4	0	10.0 ...	14	6
23	2.30 ...	6	9	10.30 ...	13	9	3.0 ...	3	6	11.0 ...	14	9
24	3.0 ...	6	6	11.0 ...	14	0	4.30 ...	2	6	11.30 ...	15	6
25	5.0 ...	6	6	11.30 ...	14	6	5.0 ...	2	0	11.45 ...	16	0
26	6.0 ...	6	3	0.0 ...	0	0	0.15 ...	14	6	6.0 ...	2	0
27	1.0 ...	14	6	6.30 ...	6	6	1.0 ...	14	3	7.0 ...	2	0
28	1.15 ...	16	0	7.0 ...	7	0	3.0 ...	13	9	7.30 ...	5	0
29	1.45 ...	15	0	8.0 ...	7	6	3.15 ...	13	3	7.30 ...	3	0
30	2.0 ...	14	6	8.0 ...	7	6	2.15 ...	12	9	8.0 ...	6	0
31	3.0 ...	13	0	8.30 ...	7	6	3.15 ...	11	3	8.30 ...	6	3

NOVEMBER 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	4.0 A.M.	12	0	9.0 A.M.	7	6	4.0 P.M.	11	0	8.30 P.M.	6	0
2	4.30 ...	12	0	9.30 ...	7	9	4.15 ...	11	0	10.0 ...	7	0
3	4.0 ...	11	6	11.0 ...	7	0	5.30 ...	11	0	11.30 ...	8	0
4	6.0 ...	11	6	0.0 ...	0	0	0.15 ...	7	6	6.30 ...	10	9
5	1.0 ...	8	6	7.0 ...	11	6	1.0 ...	7	0	7.0 ...	12	0
6	1.30 ...	9	0	7.30 ...	13	0	2.0 ...	5	0	8.30 ...	14	0
7	2.45 ...	8	0	8.0 ...	14	3	4.0 ...	3	6	9.0 ...	15	3
8	3.30 ...	7	0	9.30 ...	14	6	4.15 ...	3	0	9.30 ...	16	3
9	4.0 ...	6	6	10.0 ...	14	9	5.0 ...	1	6	11.0 ...	17	3
10	5.30 ...	6	0	11.30 ...	15	6	6.0 ...	1	0	0.0 ...	0	0
11	0.15 ...	17	6	6.0 ...	5	0	1.0 ...	15	0	6.30 ...	1	0
12	1.0 ...	17	6	6.15 ...	5	6	1.30 ...	15	0	6.0 ...	1	0
13	2.0 ...	16	9	6.45 ...	5	0	2.0 ...	13	6	7.0 ...	2	0
14	2.0 ...	15	6	7.0 ...	5	0	2.30 ...	12	9	7.0 ...	3	0
15	2.45 ...	15	0	8.0 ...	5	6	3.0 ...	12	6	8.30 ...	4	0
16	3.0 ...	14	9	8.30 ...	6	0	3.30 ...	11	9	9.30 ...	5	0
17	3.30 ...	13	9	10.0 ...	6	0	4.0 ...	11	0	10.0 ...	7	0
18	4.0 ...	12	9	10.30 ...	6	0	5.30 ...	10	6	0.0 ...	0	0
19	1.0 ...	6	9	6 30 ...	12	0	1.0 ...	6	0	7.45 ...	12	9
20	1.30 ...	6	6	8.0 ...	12	6	2.0 ...	4	6	8.30 ...	13	6
21	2.45 ...	6	0	8.45 ...	12	9	3.30 ...	4	0	9.0 ...	12	6
22	4.0 ...	7	0	9.30 ...	13	0	4.0 ...	2	6	10.0 ...	13	6
23	5.0 ...	7	0	10.0 ...	14	6	5.0 ...	2	6	10.30 ...	13	3
24	5.30 ...	7	3	11.0 ...	15	3	5.30 ...	2	9	11.0 ...	15	6
25	6.0 ...	7	6	11.30 ...	13	6	6.0 ...	3	3	0.0 ...	0	0
26	0.15 ...	16	0	6.0 ...	8	0	1.0 ...	13	6	6.30 ...	3	6
27	1.0 ...	15	9	7.0 ...	8	0	1.15 ...	13	3	7.0 ...	4	0
28	1.30 ...	15	0	7.30 ...	8	3	1.30 ...	13	0	7.30 ...	4	3
29	2.0 ...	14	9	8.0 ...	8	6	2.0 ...	12	9	8.0 ...	5	0
30	2.30 ...	14	6	8.30 ...	8	6	2.30 ...	12	3	8.45 ...	5	0

DECEMBER 1840.

Date.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.	Time.	F.	I.
	H. M.			H. M.			H. M.			H. M.		
1	3.30 A.M.	13	9	10.0 A.M.	8	6	4.0 P.M.	11	6	10.15 P.M.	7	0
2	4.0 ...	13	0	10.30 ...	8	6	4.30 ...	11	3	11 0 ...	8	0
3	5.0 ...	12	9	11.0 ...	8	0	5.45 ...	11	9	0.0 ...	0	0
4	0.15 ...	8	6	6.0 ...	13	9	1.0 ...	5	0	7.0 ...	13	0
5	1 30 ...	8	0	7.0 ...	13	3	1.45 ...	4	6	8.0 ...	14	3
6	2.0 ...	7	6	8.30 ...	13	6	2.30 ...	2	6	9.0 ...	15	0
7	3.0 ...	7	0	9 30 ...	13	9	3.30 ...	1	6	10.0 ...	16	0
8	3.30 ...	6	9	10.0 ...	14	0	5.0 ...	2	6	11.0 ...	17	6
9	4.30 ...	6	6	11.15 ...	14	6	6.0 ...	2	0	11.30 ...	17	9
10	5 30 ...	6	0	11 30 ...	15	3	6.30 ...	1	6	0.0 ...	0	0
11	0.15 ...	18	0	6.30 ...	5	6	0.30 ...	15	6	6.0 ...	2	0
12	0.45 ...	18	0	7.0 ...	5	6	1.0 ...	15	3	7.0 ...	2	9
13	1.15 ...	17	3	7.30 ...	5	0	1.30 ...	14	9	7.30 ...	3	0
14	1.45 ...	16	6	8.0 ...	4	9	2.0 ...	14	0	8.30 ...	3	3
15	2.30 ...	15	3	9.0 ...	4	9	3.0 ...	13	6	10.0 ...	4	0
16	4.0 ...	14	6	10.30 ...	6	0	4.30 ...	12	9	11.0 ...	7	0
17	5.0 ...	13	6	11.30 ...	6	0	6.0 ...	12	6	11.45 ...	7	6
18	6.0 ...	13	0	0.0 ...	0	0	0.30 ...	5	6	6.0 ...	11	0
19	0.30 ...	8	0	7.0 ...	12	0	1.0 ...	5	0	7.30 ...	12	0
20	1.15 ...	7	6	8.0 ...	12	3	1.30 ...	3	9	8.30 ...	13	0
21	2.0 ...	7	0	9.0 ...	12	3	2.0 ...	4	0	10.0 ...	14	6
22	2.30 ...	7	0	10.30 ...	12	6	2.30 ...	4	0	11.30 ...	15	0
23	2.45 ...	7	0	11.45 ...	12	9	3.0 ...	3	9	0.0 ...	0	0
24	0.15 ...	15	9	3.0 ...	6	9	0.15 ...	13	3	4.0 ...	3	6
25	0.45 ...	16	0	3.45 ...	7	0	1.0 ...	13	6	5.0 ...	3	0
26	0.15 ...	16	0	4.45 ...	6	9	1.30 ...	13	9	6.0 ...	4	0
27	1.0 ...	15	6	5.30 ...	6	9	2.0 ...	13	6	6.30 ...	3	9
28	1.30 ...	14	9	6.30 ...	6	6	2.30 ...	12	6	7.30 ...	4	6
29	2.0 ...	14	3	7.30 ...	6	6	3.0 ...	12	3	9.0 ...	5	6
30	3.30 ...	14	6	9.30 ...	6	6	3.45 ...	12	6	9.30 ...	5	9
31	4.0 ...	14	0	10.0 ...	6	0	4.30 ...	12	3	10.0 ...	7	0

Journey from Tajoora to Ankober. By Assistant-Surgeon R. KIRK.

May 15, 1841.—All necessary preparations having been completed, the mission to the Court of Shoa, under Captain Harris, left Aden this day, at noon, on board the Honourable Company's brig *Euphrates*, and, with a light breeze, stood across the Arabian Gulf. On the afternoon of the 16th the African coast appeared in sight, and towards evening the lofty mountain range in the vicinity of Ras Bir became very distinct. Passing the low group of Mussah Islands, we stood up the bay of Tajoora; but, darkness setting in, were compelled to lay to until daybreak of the 17th, when we stood in to Tajoora, and anchored close to the schooner *Constance* about half a mile from shore, having made the passage from Aden in forty-two hours.

The bay of Tajoora is a deep inlet of the sea, extending, in a S.W. direction, about forty-five miles to the entrance of the small inner bay of Goobut Khrab: the breadth of the bay at Ras Bir is more than thirty miles, and gradually narrowing: at Tajoora it is but eleven miles wide, beyond which the northern and southern shores incline to each other at the Bab, which is scarcely a mile across, and divided into two straits by a small island.

Entering Goobut Khrab near the centre of its eastern side, its longer axis is found to run N.W. and S.E. for about twelve miles, its greatest breadth being five: the average depth is stated to be about 120 fathoms.

The shores of both bays are shut in by lofty ranges of mountains—on the south shore presenting the appearance of a bluff table-land; on the northern side rising range beyond range of a rounded character near the coast, but the horizon bounded by a peaked chain running parallel with the bay.

The utility of this otherwise noble bay is much diminished by the great depth of water: it offers few anchorages, and those of a very insecure nature. The brig and schooner were anchored not half a mile from the shore in twelve or fifteen fathoms, and there was scarcely room for another vessel to ride.

Tajoora, situated on the northern side of the bay, thirty miles from its entrance, in lat. 11 deg. 46 min. 35 sec. N., and long. 43 deg. 20 sec. E., is a Donakil town, the residence of a chief of the Adalli tribes, who assumes the title of Sooltan: it is built close to the sea shore, and contains from 250 to 300 houses, and about 1200 inhabitants.

The houses are of rude construction, formed of a strong frame-work of rough rafters covered with matting, and having a pent roof: two or three huts, each of one room, are generally enclosed in a small court-yard, forming the habitation of the more respectable families; and the residence of the Sooltan is but little superior to the rest, with the exception of having an upper room. There are also two or three small

mosques built of madrepore, with flat roofs: these are whitewashed, and kept tolerably clean. A plentiful supply of good water is obtained from a well sunk near a group of date trees to the N.W. of the town. Some of these trees are protected by enclosures, being the only traces of cultivation to be found in the neighbourhood.

The scenery in the vicinity of Tajoora is very fine—the broad expanse of the bay, enlivened by a few native boats or a fleet of fishing catamarans, is bounded on all sides by blue and distant ranges of mountains. To the westward the peak of Jibul Goodah, of about 4000 feet elevation, towers above the rest. To the northward of Tajoora the hills rise in successive ranges, the lower ones near the sea being of coral growth; behind these are rounded limestone hills, and beyond the peaked range of basaltic formation, whilst a belt of sandy beach, edged with acacia jungle, forming the high road to Ambaboo, is traversed by groups of Bedouin women, bringing fuel and supplies from the neighbouring villages.

The inhabitants of Tajoora are chiefly composed of the Donakil tribes, and are a stout well-formed race, darker in colour and stouter in frame than the Arab, generally with regular and expressive features. Their teeth, as with most eastern races, are remarkably fine; but their hair forms the most striking point in their appearance, being thick and bushy, having the woolly appearance of the Negro, but of greater luxuriance. They seem to bestow much care in its culture, combing it out very full and plentifully, bedewing it with mutton fat, whilst at night they use a small uncomfortable wooden pillow, supporting the cheek, lest they should derange it in their sleep.

Many of them change the colour of their hair by the application of lime—probably from the caprice of fashion, though they assert that, from the thickness of their hair, it is the only means of freeing it from vermin. They have also a singular custom of substituting a bushy wig, ingeniously made of black sheepskin, when age has deprived them of their natural defence against the rays of a tropical sun, as they seldom wear any turban or covering to the head. They have generally but a very scanty beard or moustache. Their dress consists of a white or blue checked cloth bound round the waist and reaching to the knees; and another large loose cotton robe, covering the body and thrown over the shoulder—neither of them usually very clean. Thin sandals of a very simple construction protect their feet.

Their arms, carried by all, consist of a strong serviceable spear, and a creese buckled round the waist and used for every purpose. Most of them also carry shields on a journey; but we did not see a single matchlock or firearm of any description in their possession, except a rusty 6-pounder on the beach with which they return salutes.

Their whole appearance is very classic, resembling the old Roman costume as seen in ancient statues—their naturally fine, easy, and graceful figures, the large round shield and strong broad-headed spear, adding much to this effect. Many of them would form admirable studies

for the artist, and often reminded me of the beautiful designs of Flaxman.

Of the younger women many were good-looking, but their beauty is very transient, and is lost before they attain a mature age.

The Donakil appear a good-humoured race, tolerably honest, but extortionate and most inveterate liars, and exceedingly indolent and procrastinating in their habits. In their religion they are bigoted Mohammedans, and very attentive to the outward forms of their creed, a regular attendance at the mosque forming, apparently, one of the principal occupations of the day. During our stay we had an opportunity of witnessing a marriage procession; it was headed by eight matrons, brandishing swords and creeses, and dancing to a song in which all joined. These were followed by the bride, concealed under a canopy of blue cotton, supported by a party of the belles of the village, the procession being closed by all the idle children in the place. In a return party the sword-bearers were replaced by a number of children carrying the wedding presents in ornamented baskets. The marriage tie, however, does not appear to be very binding; most of the population are engaged in the trade in slaves, from whom they frequently choose their wives; and we were told that on any disagreement or misconduct, or should a little ready-money be required, it is no unusual custom to ship a wife or two for the Arab market. Education, to the extent of reading the Koran, seems general amongst the boys; on being dismissed from school the master chalks the faces of such as have behaved well or excelled in their studies, and we saw many of the children playing about with their faces thus whitened; those who had gained praise for their writing lesson were marked with black streaks.

The Donakil seem to be a healthy race. The old Arab remedy of writing a passage from the Koran on a cup or piece of paper, and then washing off and drinking the ink, seems in equal repute here, the Sooltan being frequently applied to on such occasions.

The authority of the Sooltan, a decrepid, imbecile old man, named Sooltan Mohammed ibu Sooltan Mohammed, extends nominally from Mursa Dooan to the salt lake Bahr Assal; but he appears to have little power out of his own town. Most of the inhabitants are engaged, during some period of the year, in accompanying their kafilas to the marts of Oussa or Abyssinia, to which places they carry salt, Indian cotton cloth, and other foreign articles, and return with slaves, grain, ivory, and the productions of the interior; salt and slaves, however, appear to constitute the principal articles of traffic. At Tajoora there is no regular bazaar; dollars are used in larger purchases, but they have no smaller currency—buttons, beads, tobacco, or bottles, are received in exchange for milk, fish, &c.; and amongst themselves hides, divided into portions suited to the formation of the soles of their sandals, are used in barter.

The weather during our stay at Tajoora was very hot, the thermometer in our tents generally rising to 96 or 98 degrees during the day,

though rendered less oppressive by the sea breeze, which usually sets in about 11 A.M. The nights also were very close and warm.

We remained at this place until the end of May, the detention being principally caused by the difficulty in procuring camels, owing to the advanced season of the year, the approaching hot season, and dreaded shimal, being said to render the earlier portion of the road nearly impassable; much difficulty also arose from the avarice and extortions of the principal authorities of the place. At length these were overcome; camels, originally promised at seventeen dollars each for the journey, could only be obtained at the rate of twenty, and an exorbitant sum was demanded as the pay of an escort. Great objections were raised to the size and weight of many of the packages containing the presents for the King of Shoa, and much time was occupied in reducing their dimensions where practicable. At last the camels began to arrive, and on the 25th we had the pleasure of seeing the first string of eleven start on their road to Ambaboo, there to rendezvous until the required number was obtained; from this time from twelve to thirty were despatched daily, until the 30th May, when the number reached about one hundred and fifty. No more camels being procurable, it was determined to leave the remainder of the baggage, and part of the Mission, until arrangements could be made at Shoa, and proceed with those already laden.

The camels, with the exception of ten procured by Sheik Shoomake from Zeyla, were far inferior to the Indian camel, the saddles very simple and light, but, as our experience during the journey proved, of a good construction, very few of the camels becoming sore-backed. It consisted of two or three mats thrown over the back, then a couple of sticks on each side fastened above, and two round pads formed of date stalks, sewn in matting, to relieve the hump and spine from pressure. The camels were divided amongst many proprietors, some having fifteen or twenty, others only one, the owners generally taking charge of them on the journey.

Esak and Cassim, brothers of the Sooltan of Tajoora; Mohammed Ali, son of Ali Abi of the Rookhba; and Abrahim Shem, of the Abli tribe, are the principal natives who accompanied us.

Our party now consists of Captains Harris and Graham, Assistant-Surgeon Kirk, Lieutenant Barker, I.N., and Dr Roth, with an escort of ten European soldiers from Aden, all mounted on mules procured at Tajoora; but we also have several horses brought from Aden.

May 30.—Much to our delight we this evening bade adieu to Tajoora, and rode out to our camp near Ambaboo, the road running either on or parallel to the beach. About a mile after leaving Tajoora the hills recede from the coast, leaving a flat sandy plain, thickly wooded with low acacia bushes; proceeding about three miles we crossed the bed of a brook running from the hills to the northward to the sea, and soon afterwards reached the camp, which we found pitched in a grassy nook near the beach, close to the course of a mountain stream, from pools in the bed of which an abundant supply of water was obtained. The

village of Ambaboo was distant about one mile to the westward, near a group of date palms.

May 31.—Halted at Ambaboo, Esak and Cassim being detained at Tajoora to attend the funeral of a nephew of the Sooltan's. In the morning, strolled up the bed of the stream, saw several varieties of birds of very fine plumage; hog, a small species of antelope, Guinea fowl, and spur fowl, are found in the neighbourhood. Felt the heat very oppressive during the day, having only the outer fly of our tent pitched.

June 1.—At daybreak our kafila commenced loading, camel after camel left the ground, and every thing proceeded quietly and without confusion, when, on the last string moving off, it was found that many loads still remained, for which no carriage was forthcoming, nor were Esak, the Ras el kafila, or the other leading men, present; a messenger was immediately despatched to Tajoora, awaiting whose return we spent the day beneath the slight shelter of a low date-bush, shifting our position with the moving shade, and it was not until we had got well on the eastern side that Lieutenant Barker, and shortly afterwards Esak, Cassim, and Sheik Shoomake, arrived, when, after a long and rather angry conference, the remaining camels were brought, and it was conceded that we should halt one day at our next station, to allow the Donakil to complete their preparations for the journey. Accordingly the last load having left the ground, we started about 6 P.M., and after a hot ride of about seven miles along the beach, hungry and tired we reached our tent at Dulool.

June 2.—Dulool, a Bedouin camp, possessing a few wells but no permanent habitations, is situated at the abutment of a spur from Jibul Goodah, running north-east and south-west, gradually diminishing in height until it terminates about one hundred yards from the beach; the rocks are trachyte and porphyritic, and evidently of volcanic origin. The intermediate plain between the hills and shore is a thick jungle of acacia, intermixed with a few tamarisk trees; whilst Jibul Goodah, and the range to the northward, appear wooded to their summits.

No incident of importance occurred during the day, save a slight misunderstanding with the Bedouins at the wells, who demanded a dollar for the use of them; this being happily settled, we passed a quieter day than has fallen to our lot for some time, the heat being our only annoyance, the thermometer ranging as high as 96 degrees.

In the evening Esak came out from Tajoora, so that there appears at last a probability of our final start.

June 3.—Commenced loading the camels at daybreak, but as we remained until all had started, did not leave Dulool until nine. The road ran along the margin of the bay, the hills gradually receding from the coast; about a mile from Dulool passed the wells of Sooktu, and on rounding a point, near a clump of date-trees, had an extensive view of the western portion of the bay of Tajoora, bound in on all sides by mountains: the entrance of Goobut Khrab was distinctly marked by a

low black point extending from the northern shore: the plain, extending to the northern mountains, was clothed with jungle, and near the beach we passed several pretty patches of a species of convolvulus.

A party with five camels passed us on the road laden with juwaree in long cylindrical bags of matting, sixteen or twenty forming a camel load; they had also two elephants' tusks, and accompanying the kafila was a group of fifteen children, chiefly girls from the age of seven to fourteen—slaves from Abyssinia, and the first party we have seen on their march. Some of them were leading the camels, the rest strolling along the road; they were tolerably clothed, all appeared stout and healthy, and none of them sore-footed.

We reached the wells of Sagalla at 10 A.M., the whole distance not being more than two and a half miles. After breakfast, several of the party started in the *Constance* schooner (which had moved up to this station) to visit the Bab or entrance to the inner bay, but had scarcely proceeded a mile when a messenger arrived from Shoa. The schooner was recalled by signal, when he proved the bearer of letters for Aden, from Messrs Krapf and Beke, dated 20th April, (forty-four days.)

During the day, Cassim, Mohammed Ali, and the principal men who are to escort us through the Adel country, joined the camp, and this being the last station at which water can be obtained before passing the Salt Lake, the skins are to be filled up to-morrow, and we are to start at midnight. Ther. 96°.

June 4.—This morning two more strings of camels passed our camp, laden with grain; one had a party of twenty slaves, the other of fifteen belonging to it—all children, and, as yesterday, stout and healthy. The day was principally occupied in filling the water skins, and by evening everything was prepared; but Mohammed Ali now proposed that we should allow the baggage to move on, and join it to-morrow night—thus escaping one day's residence in the wilderness; this was not agreed to, but the discussion kept us up till eleven, and at midnight the signal was fired, and the camel-men commenced loading.

June 5.—All the baggage being off the ground by 2 A.M., we commenced our march, the moon shining brightly; the road at first ran parallel with the beach, rough and pebbly, the vegetation becoming less luxuriant. After passing about two miles, we came to a low spur from the Goodah range; and after another couple of miles the road struck off from the beach over low undulating hills, thickly strewn with boulders, and affording a very bad road for our mules and camels. We passed over this ground for about three miles, and then came to the entrance of a narrow ravine, called Gulalafoo, about half a mile long and not more than sixty or eighty feet in breadth, bounded by precipitous rocks of about 150 feet high. Emerging from this pass, we commenced traversing a hilly country, thinly wooded with leafless acacias; on the summit of one of these hills, commanding a fine view over the bay of Tajoora, we halted for the arrival of the kafila; then crossing a table-land, from which we had glimpses of Goobut Khrab,

the road ran parallel with Jibul Goodah, till we descended into an extensive valley, about two miles broad, running W.N.W. Crossing this to the westward, we ascended a low hill, and passed along its precipitous bank for half a mile, when we came to a hilly table-land, most dreary and desolate in appearance—thickly strewn with dark shining pebbles of lava, with scarcely a trace of vegetation; the surrounding hills were of no great elevation, and equally barren. We passed a small encampment of camel-men, and after another mile reached the halting ground of Warilissan at 8 A.M., having marched fourteen miles. Neither forage or water for our cattle were to be obtained in the neighbourhood, and the camels fared but little better. We found the height of Warilissan above the level of the sea to be by barometer 1778 feet, by the boiling point 1617 feet—giving a mean of 1697; notwithstanding which elevation, the heat was scarcely less oppressive than in the lower country.

June 6.—Started at 3 A.M., as it was not considered prudent by our Ras el kafila to march until the moon had attained a considerable elevation; and we very soon discovered the cause of this precaution, as at a quarter mile from our encampment we came suddenly on the entrance of the Pass of Rah Esa—"the road of the Eesas"—being the path usually chosen by that tribe in their forays into the Donakil country, and where some of their severest battles have been fought. The pass winds through a deep ravine to the southward for two or three miles; the scenery, as viewed by the uncertain moonlight, was wild in the extreme—dark frowning basaltic cliffs towering on either hand, whilst huge masses of rock block up the bed of what in the rainy season must be an impetuous torrent.

The path, utterly impassable for guns, was with difficulty traversed by our camels; at length the road became more level, and proceeding through a narrow valley for another two miles, Goobut Khrab and the island of Gode Ali, at its western extremity, opened on our view—the intervening coast consisting of black sheets of lava hardened in their course to the sea. Turning the corner of a range of basaltic hills, our road ran along their base, and passing over several miles of volcanic country, the lofty conical peak of Jibulseearo came in sight, and soon after the salt lake of Assal appeared at its base.

The Bahr Assal appeared to be oval in shape, and about seven miles long in its greater diameter; it is pent in by high peaked mountains for about two-thirds of its circumference, the remaining space towards Goobut Khrab being a sheet of black lava, sloping gradually towards the lake, and having several deep craters and volcanic fissures on its surface. There was something exceedingly striking in this first view of the lake; about one-third of its surface was covered with a sheet of solid salt, its dull, dead, white aspect contrasting strikingly with the remaining blue surface of the lake; but the whole scene was gloomy and almost unearthly. No sound of bird or beast broke on the ear, no ripple moved on the dull molten surface of the lake; a white foam on

the shore might for a moment deceive the eye with an appearance of motion and fluidity, but when you watched it, it remained unchanged —a salty efflorescence. Our halting ground lay near the margin of the lake, but we had to traverse several miles of lava hills, the limestone formation occasionally showing through, before we could approach it, and had then to descend a short pass down a cliff, most steep and difficult for our camels; below was the small sandy plain of Mooya, on which we encamped about 11 A.M., having marched sixteen miles. The heat was now becoming most oppressive; there was a heaviness about the atmosphere, partly owing to our being nearly 600 feet below the level of the sea, and partly to the saline exhalations from the lake, which I have scarcely felt equalled even on the burning plains of Upper Scinde—the thermometer rising to 126° in the shade. Our tent not having arrived, we had no shelter save the slight shade of a few almost leafless acacia bushes, or the sickening closeness of the small caves formed by the fallen masses of volcanic rock; to add to our misery, a hot fiery blast from the N.E. continued to blow during the whole day, and the only water to assuage our continued thirst was afforded by the scanty and disgusting contents of the skins filled at Sagalla. The day passed slowly on; group after group of camels, with long intervals, made their appearance on the plain, as they were with difficulty brought down the narrow pass. Our mules and horses having received no water to-day, and but little yesterday, were nearly exhausted, and it was determined, as soon as the moon rose, to leave the baggage to follow, and push on to the next halting ground, where water would be obtained.

In the midst of this most interesting spot in a geological point of view, we were compelled to confine our researches to the general character of the country, as it was impossible from the heat of the weather to examine it more minutely in detail. Mooya, on the south-eastern border of the Bahr Assal, from observations made by Lieutenant Christopher, I.N., is in lat. 11° 38′ 12″ N., and long. 42° 33′ 6″ E.; and by barometrical observations, carefully made by him in Goobut Khrab, with corresponding ones on the borders of the lake, it was determined to be 559 feet below the level of the bay; the boiling point by thermometer gave a depression of 481 at our camp, which, being about 100 feet above the level of the lake, gives its depression 581; the mean of the two sets of observations being 570 feet below the level. Several theories were broached to account for this unusual phenomenon. The oval appearance of the lake, surrounded on three sides by volcanic mountains, the fourth consisting of sheets of lava, seemed to indicate the site of an extensive crater, whose cone having fallen into a subterranean abyss, had given rise to the appearances we witnessed.

But I conceive the opinion of Dr Roth on this subject to be far more probable—viz., that the Bahr Assal was once a continuation of the bay of Tajoora and Goobut Khrab, but has been separated from them by a stream of lava, about six miles in breadth, which, from its point of

greatest elevation, where there are still the appearance of several craters, gradually slopes to the eastward towards the waters of Goobut Khrab, and to the westward into the basin of the Salt Lake.

The waters of Tajoora and Goobat Khrab are deep; in the bay of Tajoora there are no soundings, and in Goobut Khrab 115 fathoms, or 690 feet, which, if the depth of water formerly in the lake corresponded with the Goobut Khrab, would allow 120 feet for its present depth, to which it has been diminished by the great annual evaporation that must take place, and hence the saline incrustation on its surface. This diminution is also proved by a white incrustation, of considerable height, on the face of the rocks bounding the lake.

Its present depth we had no means of ascertaining, but, from the appearance of the south-west extremity, subsequently traversed, it did not appear very great at that part. In the course of time, I should conceive it would eventually dry up and form a field of rock salt, which, when covered in by the debris washed down from the neighbouring mountains, would form an extensive depôt for the supply of future ages.

From the present narrow channel between the bay of Tajoora and Goobut Khrab, probably by the effects of subterranean influences—shocks of earthquakes being occasionally felt in its neighbourhood—the inner bay also will in the lapse of ages be converted into a salt lake resembling the Bahr Assal.

At eleven at night we left this dreary and unwholesome spot, the hot north-east wind scarcely diminished in its sultry fierceness, and commenced our march to Goongoonta, situated in the bed of a stream which opens into the lake at its south-west extremity, having its source at Ulooli, the highest point of the Gollo range, but its waters seldom reach the lake, except in the rainy season. The shortest road to Goongoonta is round the margin of the lake; but owing to the precarious and rugged nature of the sheets of lava, over which the path winds, it was considered more advisable to follow the road, crossing over ridges of volcanic hills, whose immense slabs of lava in many parts form scenes of the wildest description, the road, scarcely passable for our exhausted cattle, sometimes skirting the valleys at their base. The night was fearfully hot, and the whole party suffered most severely from thirst; several of the European escort and native followers fell out on the road, and could not be induced to continue their march. Most grateful were we when, about ten miles from Mooya, we met a man sent out with a supply of water from Hanlifanta; refreshed by this well-timed supply, we pushed on to the solitary well at that station, where we found Mohammed Ali and his men filling up water for the kafila. Having again assuaged our thirst, we passed over a range of low limestone hills for a mile and a half, when we descended on to the shores of the Salt Lake, over the hardened surface of which we crossed in a north-westerly direction to the opposite coast, a distance of about two miles. Near the margin, from its soiled and dirty appear-

ance, the salt crust appears to rest on the earthy bottom, but afterwards it became brighter and of a purer colour, and appeared sustained on the surface of the lake like a sheet of ice, irregularly cracked in all directions and covered with a white efflorescence resembling snow, affording, however, a good and tolerably firm road for our cattle. We observed one well-trodden road, extending from the south-west to the north-east end of the lake, from which part the finest salt is obtained. Near the beach was a kafila loading with salt for the Hurrar and Abyssinian market; it was packed in lumps in the same long narrow bags as juwaree.

Arriving on the western bank, we crossed for a mile over low hills covered with basaltic boulders, and then descended into the dry bed of the mountain stream, passing up the pebbly bed of which, the basaltic cliffs increasing in height and approximating as we advanced, we reached, after a march of sixteen miles, at 9 A.M., the first running stream I had seen since leaving the Indus; the water was but in pools of a few inches deep, but it was clear and bright, and our fatigue and thirst were soon forgotten whilst resting under the shade of the overhanging rocks at its brink. Proceeding half a mile farther, we came to the halting-ground of Goongoonta, the ravine beyond apparently shut in by the lofty and precipitous rocks of porphyry and basalt which form the sides of the pass.

We spent a hot day in some small caves formed by the fallen masses of rock, scarcely sheltered from the mid-day sun, and exposed to the fierce hot blast from the Salt Lake.

During the day all the followers, for whom water had been sent back, reached camp, and by evening not a horse or mule was missing. As our guides stated that murders are frequently perpetrated at night by the mountain Bedouins at this place—a race, they said, "who fear neither God nor man"—we moved back in the evening to a small open space where the baggage had been pitched, and posted a sentry to guard our camp. The night was very hot and close.

June 8.—As many of the camels had not been able to proceed farther than Hanlifanta, we did not march this morning, and at daybreak returned to our old station in the caves, where we passed another most oppressive day, the thermometer rising to 110 deg.; our horses and mules, however, picked up a little grass on the margin of the stream, and were much improved by the day's halt. In the evening we moved down to the open space; the European escort slept at the foot of a low stony bank, and our beds were laid near theirs, on a more open spot—a sentry, as yesterday, patrolled the line during the night. About midnight, a strong hot blast of the simoom came rushing up the ravine, almost suffocating us with dust and its pestilential heat; it was followed by a few drops of rain, and then a calm equally oppressive set in.

June 9.—At 2 A.M. we were awoke by a fearful cry from the escort, who rushed to our quarter, and we found that whilst the sentry's

back was turned, they had been attacked as they slept. On proceeding to the spot we found two of them in the agonies of death, one had been stuck in the neck just below the ear, the other been stabbed in the abdomen; and an unfortunate Portuguese cook, who slept last in the row, had also received a wound from which the intestines were protruding. Mohammed Ali, who was aroused by the noise, had seen two men running down the ravine, and immediately started in pursuit, but returned unsuccessful. The remainder of the night was passed in melancholy converse on the fate of our comrades. They were two of the best and finest-looking men we had, and, from their former occupations, to us invaluable; one having been a farrier, the other a worker in leather. The poor cook, too, had, it was evident, received his death wound. Esak and his men voluntarily commenced preparing the graves, piling up stones against the side of the rock; and before daylight, with a short but impressive prayer, they were consigned to their untimely tombs.

From subsequent inquiries, there could remain no doubt that the cold-blooded deed had been perpetrated by the Bedouins, who, stealing down a hollow in the bank, had stabbed them as they slept. No attempt at plunder appeared as an excuse for the crime; but their only object seems to have been to acquire that estimation and distinction amongst their tribe, only to be acquired by these savages by deeds of blood.

Spite of several camels being still behind, our camel-men decided on leaving this hateful spot, and at 9 A.M. we started, the wounded cook being placed on a camel. Fortunately the morning was cloudy, and we did not experience much inconvenience from the heat.

A quarter of a mile from Goongoonta the road takes a sharp turn to the westward, where the camels had to ascend a most difficult steep. A road having been built up the face of a steep rock, some of them required to have their loads removed, but most of them surmounted the difficulty in a better manner than could have been expected, even crawling on their knees at the worst part. After passing this the road became comparatively easy, winding through the Wady Kelloo, which was faced with precipitous rocks of basalt. Water was plentiful the whole way, and we passed several green grassy spots and an occasional palm-tree, under one of which we found Ali Arab with the body of the Portuguese who had died on the road, and a grave ready prepared for its reception. Having performed the last rites to this third victim we proceeded on our route, and, after a march of nine miles, at half-past one P.M. reached Ulooli, the head of the Wady, from whence the stream during the rains flows to the Bahr Assal.

By thermometrical observations we found this spot to be 228 feet above the level of the sea. So much mercury had leaked from the barometers, owing to the extreme heat they had been exposed to, that no reliance could be placed on their indications, and in the course of the journey their tubes became broken, in spite of every precaution in

their carriage, rendering them entirely useless, as we had no spare ones.

We found here a beautiful patch of green grass on which our cattle were turned to graze, whilst we took shelter under a group of doom palms. Some fine antelopes were shot on the adjacent hills. Several parties of natives were seen during the day, but these seemed a pastoral race. However, every precaution was taken at night to prevent a surprise, two European sentries were posted, and the officers of the mission kept watch in turn, a musket being fired every hour in token of our vigilance, and this discipline is to be continued during the remainder of the journey.

June 10.—Several camels not having arrived, and this being a good spot to recruit our cattle, halted and pitched our tent under the trees. The water here, as at Goongoonta, was saline, adding to rather than assuaging our thirst; during the day all the missing camels arrived.

June 11.—Started by moonlight at a quarter past 1 A.M., and passed to the south-west for three miles over low rounded hills and small level valleys, both perfectly barren,—then came to a cairn of stones, under which lie buried, as our guides informed us, a father and his daughter, who, in days long gone, having been here detected in incest, were stoned to death, and each wayfarer adds one to the heap; shortly afterwards the valley opens on to the extensive plain of Guggadee, about eight miles in breadth, and extending north-west and south-east, the horizon being only bounded by the distant mountain ranges. The road to Oussa branches off here, passing up the valley to the north-west; it was stated to be a three days' journey for a kafila. Our road crossed the plain to the southward, passing for the first two or three miles over a surface of hardened and crooked alluvial deposit brought down by the rains, and much resembling the deserts of Upper Scinde; we then passed through a thin jungle of acacia and a species of spartium, and near some low hills on the southern side of the plain, reached the dry pebbly bed of a river which, here dividing into two branches, expends itself on the plain. Leaving the plain and following the bed of the river, the road entered a small valley, in which, at the foot of a rock, we found some pools of bitter and undrinkable water, and shortly afterwards arrived at the station of Bedikuruoff, having marched sixteen miles, occupying six and a half hours. Our camp was pitched on a small stony hill above a hollow where water was found, as yesterday it was brackish. A few antelopes were seen on this day's march, and several parties of Bedouins were observed in the neighbourhood.

June 12.—Started at 3 A.M., the road for two miles passing over low stony hills, we then entered the Wady Koree, a verdant-looking valley, apparently abundantly supplied with moisture, as its bed was green with low palm bushes, tamarisk, and acacia trees, whilst we passed frequent flocks of goats grazing, under the charge of some old crone in leathern petticoat, or watched by children; at every turn of the valley we saw groups of men, women, and children assembled on the edge of

the low hills watching our progress; they were of the Debenill Weema tribes, the men, as usual, armed with spear and shield, the women busily employed platting mats; they appeared a pastoral race, but the men are occasionally occupied in carrying salt, by which traffic they obtain their supply of grain and clothing. Wady Koree varies in width from two to four hundred yards, and is bounded by low hills of basalt and porphyry; we also saw some cliffs of conglomerate and sandstone. After a march of eight miles halted at Sugadara, near a small Bedouin camp; water of rather an improved quality was found under a green-stained basalt rock.

Our tent being pitched close to a black pebbly hill, was very hot and oppressive, the thermometer during the day rising to 110 degrees.

By a meridian altitude of the star Benetnach, taken by Lieut. Barker, Sugadara was determined to be in 11 deg. 19 min. N. lat.

June 13.—One camel missing, in search of which we were detained three hours. At length we started, our road winding with a gradual ascent through the Wady, the hills gradually diminishing in height, and after three miles we reached the level of the upper plain, over which we crossed one mile to the station of Murrah, where we halted at 7 A.M. near the foot of a low range of hills running east and west, having performed a journey of four miles, for which most kafilas would scarcely have considered it worth while to load their camels.

To the west north-west, about twenty miles distant, we saw a lofty range of table-land, behind which Oussa is said to be situated. The country in the neighbourhood of Murrah is of the most dreary description; fields strewn with boulders of lava meet the eye on all sides, as if they had been showered down during a violent eruption of some neighbouring volcano, but a closer inspection shows them to be the time-worn fragments of an extensive lava sheet.

The water we obtained was very good, but two miles distant, from whence our people also brought a supply of milk. Thermometer maximum, 109 deg. By a meridian altitude of star Benetnach, taken by Lieut. Barker, Murrah is in lat. 11 deg. 17 min. 6 sec. N.

June 14.—Marched at half-past 2 A.M., ascended the low hill to westward, and reached the summit of a table-land, the same dreary stony wilderness as yesterday, the country completely strewn with rocks and boulders of lava; at daybreak, however, there was one great improvement in the character of the country, the plain being thickly studded with patches of grass, coarse, but a most welcome prospect for our exhausted cattle. At sunrise the thermometer was 83 deg., with a slight breeze from the north-east. Crossed the plain to the southward for five and a half miles, and then descended into a small open spot surrounded by low rounded hills, and soon after entered the fine level plain of Goolamoo, extending to the north-westward, crossing which we came to the dry pebbly bed of a considerable stream called Chai Kaito, the trees on its banks bearing marks of the water at times rising to the height of fifteen feet; it is formed by the junction of two streams from

the mountains, and is said to flow into the lake formed by the Hawash at Oussa. Passing a short distance through a waddy, we opened on the small plain of Ambaido, thickly wooded with tamarisk and acacia bushes, and abounding with grass, the country at last showing some signs of improvement; for days have we wound our way through dreary wildernesses and sterile ravines, with scarce a green patch to relieve the eye, where, save an occasional antelope, no beast is met with, where no song of bird cheers the ear of the wayfarer, so waste and desolate that I have found the unwonted appearance even of a solitary butterfly most carefully noted in my field-book. Following the bed of the Chai Kaito, in which even at this dry season water is found a little below the surface, another mile brought us to its junction with the Gobat stream, up which our course now lay. Cutting off a bend by crossing a low point on which we saw four ostriches, and again descending, we encamped at a station called Daduh, near the bed of the river, in which water was found on digging; marched fifteen miles. The day was very hot, the thermometer in the tent rising to 111 degrees; in the evening a stormy-looking cloud passed over from the northward, visiting us with several strong gusts in its passage.

A Soomali of our kafila stated this evening that a route from Zeyla joins at this station, that the road is good and water plentiful, being a four days' journey. Should this information prove correct, it would, by avoiding the difficult country between this and Tajoora, greatly facilitate the route to Shoa.

June 15.—Started at half past 3 A.M. Leaving the valley, the road ran south-south-west, across an extensive sandy plain, called Ramudalli, studded with coarse grass, on which we saw the first cone of the termites about six feet in height; crossing this plain for five miles, we ascended on to a slightly elevated plain, and after three miles more descended a ridge of lava on to the grassy plain of Gobat, bounded by hills running in a north-east and south-west direction: the valley is about three miles in width, shut in to the eastward by hills distant about eight miles; to the westward by a range at a distance of from twelve to fifteen miles. Crossing some lava ridges we entered the open plain, and encamped near the bed of the stream on the southern side. Marched twelve miles. By Lieutenant Barker's observations this station is in lat. 11 deg. 0 min. 56 sec. N., and the thermometrical boiling point gave an elevation of 1057 feet above the sea. This spot was pointed out to us as the site of a foray made by the Eesa Soomalies last year, when 150 horsemen drove off the flocks of the Donakil from this station; at present it is inhabited by a portion of the Roheita tribe, whose chief, who takes the title of Agil, is said to be in the neighbourhood.

June 16.—Halted, partly to rest the camels and cattle, but principally for the purpose of meeting Loheita Ibu Ibrahim, Agil of the Roheitas, a tall stalwart savage, a renowned warrior in these parts, having, after the route to Tajoora had been closed for three years, un-

dertaken a campaign against the hostile tribes and re-established the communication. Passed a hot day, thermometer rising to 110 deg. Water good and obtained from a large pool under the rocks.

June 17.—Marched at half-past 6 A.M., ascended the range to the southward, commanding a fine view over the Gobat valley, and then passed over a stony plain, covered with basaltic boulders: entering a small valley we came to a group of wells, at which a flock of sheep and goats were being watered. Proceeding half a mile further down the valley, we encamped at the station of Sunkul, which seems to be the focus of several small valleys converging from the table-land. The rocks in the neighbourhood were all basaltic, almost passing into hornblende; in one of the precipitous cliffs we found a small cave occupied by a colony of bees,—marched four miles. Thermometer at max. 108 deg. The evening was occupied in filling our water skins, a sad omen of a coming day without water to our cattle, which are now fast losing their strength from the heat and frequent scarcity of grass and water.

June 18.—Fine fresh morning, with a refreshing breeze, though the thermometer at sunrise did not fall below 84 deg. Started at 6 A.M., and ascended from the Sunkul dale on to the table-land of Hoodali; passed south-south-west over a stony level thickly studded with grass, much resembling the Deccan plains, and extending to the east and west as far as the eye could reach. After proceeding four miles saw some flocks of goats a short distance to the eastward, which we were told were at the encamping station of Arabdoora; but we passed on, as it was reported that there was not a sufficient supply of water for the kafila. Proceeding two miles further we came to the brow of the Hoodali range, from whence we had a fine view over the valley of Doolool; it appeared to be about six miles in breadth, extending, as do all these valleys, in a north-west and south-east direction to the southward, bounded by the Mari range, running parallel to the one we were on, but of greater elevation to the westward, shut in by the Oobnoo mountains crossing it at right angles, but open as far as the eye can trace it to the eastward. Its surface near the hills was in parts covered with masses of lava and blocks of basalt from the adjoining hills, but afterwards with alluvial deposit, studded with extensive tracts of coarse dry grass.

Descending the hill, a fall of about 200 or 300 feet, and skirting its base for a mile, we reached Sugageedau, an arid spot on the open plain, just on the skirt of a tract of lava; grass was abundant, and there was some forage for our camels, but no water was to be obtained, and our cattle were much exhausted even after this short march of seven miles. By the boiling point, Sugageedau is 1228 feet above the level of the sea, but the therm. rose during the day to 108 deg.; lat. by Lieutenant Barker's observations, 10 deg. 53 min. 0 sec. N.

June 19.—Started at a quarter past 4 A.M., therm. at sunrise 86 degs., the heat much relieved by a fine fresh breeze from the S.E., crossed

the valley in a south-south-westerly direction to the Mari range, the road being over a perfect level covered with coarse grass; on the plain saw a herd of twelve wild asses. After a march of eight and a half miles we reached a break or ravine in the Mari range, which is here about 1000 feet high, forming a steep sloping ridge of basaltic rock, partly covered with coarse grass, the base of the hill being lined with a thick jungle of acacias. Proceeding a short distance up the ravine, we came to some fine pools of good water, at which we watered the cattle and filled up the skins, and then returning to the plain, proceeded to an open spot called Dahwailaka, where we found our kafila encamped; passed a very hot day, the therm. at 3 P.M. standing at 107 deg. Two mules were obliged to be deserted on this last march. In the evening the Roheita chief left us.

June 20.—A fine fresh morning, although the therm. at sunrise stood at 87 deg.: at daybreak we returned to the pool to water the cattle and fill up the skins, as no water is to be found at our next halting ground. There are two roads from Dahwailaka—the shortest one passing over the range to the southward—but the camel-men declared that their beasts were so much exhausted that we must take the lower road; we therefore skirted along the base of the range in a westerly direction, passing over a desert plain for six miles, and then came to a grassy spot on which we saw a few antelopes; we next came to a small detached hill, and soon afterwards entered a jungly patch near which we halted, the station being called Oomergoolf: our day's march was about eight and a half miles. We saw some cattle grazing on the plains, but were told that no water was to be obtained in the neighbourhood. Nearly opposite Oomergoolf, the Dulool plain is divided by a projecting spur from Jibul Oobnoo, a lofty range visible to the westward, into two vallies, the southern one being named Waddy Arfa. The Mari range, which is here of about 800 or 900 feet elevation, is basaltic, its base strewn with huge masses which have been detached from the summit, most probably by earthquakes, which Mohammed Ali said were by no means of unfrequent occurrence in these parts; and that he had several times himself felt the earth shaking under his feet, and seen masses of rock falling from the hills. Another mule was obliged to be deserted to-day. Weather very hot and oppressive, therm. in tent at 3 P.M. 108 deg.; in the evening the sky clouded over, and we fully expected that the much-dreaded and still much wished-for rain was at last coming; it proved, however, to be the hot-blast of the simoom bringing with it clouds of dust: the night was very close and hot.

At this station we saw a fine effect of the mirage—a great portion of the plain having the appearance of an extensive bay shut in by the projecting headlands of the opposite range. A hot spring is said to exist in this neighbourhood, but our guides said it was unsafe to approach it on account of the hostile tribe in its vicinity.

June 21.—Started at half-past 3 A.M.; the road as yesterday skirting the base of the Mari range to the northward; a desert tract extended

for three miles, and we then entered on stony ground, thickly strewn with rounded masses of basalt and lava, apparently the detritus of the neighbouring hills; two or three miles over this brought us near the abutment of the range, here much diminished in height; we now ascended the hill, amongst blocks of lava, rendering it so bad for camels that they went round by the more circuitous route of the plain. The Waddy Arfa which we now left runs for some miles to the N.W., when it appears bounded by the Jibul Oobnoo range, over which the road to Oussa runs to the W.N.W., said to be from hence one day's journey for a mule and two for a kafila. Having crossed the lava ridge, we had a fine view over the plain of Amadoo, running parallel to, and bounded on its northern side by, the Mari range; to the westward opening on to Waddy Arfa, and to the eastward at six or eight miles' distance apparently dividing into three smaller vallies. We crossed the plain for two miles to a verdant-looking spot under the opposite hills, where, in a rocky nook, amidst huge blocks of basalt, we found a fine pool of greenish stagnant water at which our cattle relieved their thirst; it was a bustling scene, as there appears to be a populous settlement in the neighbourhood; a dozen women were busy, on the opposite bank, bathing and filling their water-skins, whilst one old lady, in spite of the Moslem prejudice against the unclean beast, was tenderly washing a pet sheep-dog. Soon after our arrival, a herd of donkeys came down to be watered; then, attracted by a herdsman's shout on the lofty summit of the opposite hill, we saw a fine drove of cattle looking no larger than sheep, slowly winding down a steep and narrow path to the pool, whilst from another direction a flock of the small Somauli sheep were driven to the water, into which they leapt and swam about like dogs. Leaving this pastoral scene of savage life, where the peaceful aspect of the shepherd contrasted strangely with the constant appearance of the shield and spear, we returned to the plain, where a numerous herd of kine viewed us with most sinister eye, and were put to flight by so unusual a sight. We then encamped about half a mile from the water, having come seven and a half miles. The Mudaitos, who occupy this pool, are said to be far from friendly to the Donakil, and, as usual, we were warned to be on our guard against them; our camp was crowded with them during the day, but they gave us no annoyance save in the gratification of their curiosity. The day was less oppressive than usual, though the therm. rose to 106 degrees.

June 22.—Started at half-past 5 A.M., therm. at daybreak 85 degrees. Our road passed over the low hill to the S.W. on to a stony table-land thickly covered with the usual basaltic boulders; after two miles we came to a small desolate hollow, apparently forming a large pond in the rains, in which we found four beehive-shaped mat huts inhabited by goat-herds, whose flocks were just being led forth to graze: we crossed this plain for about half a mile to a narrow precipitous ravine, a short distance up the rocky bed of which was a fine pool

of water, at which we watered our cattle, and then returning to the plain, ascended the hill, and proceeding for another half mile, came in sight of our camp at Koorandudah, the camels having been unladen and turned out to graze after a short three miles' march. The spot we were pitched on was a small dreary plain covered with volcanic pebbles, amongst which the dry parched grass appeared in scanty patches: to the southward the view was scarcely more promising, though the sterile appearance was somewhat relieved by a few green acacia bushes at Fiulloo about a mile distant. Our camp was found to be 1605 feet above the level of the sea.

We have now reached the country of the Debenill Wuheema tribes, and all is said to be friendship, in token of which we received a skin full of milk for breakfast, and were able to purchase a bullock; though even here the alarm-cry was raised, as three of the dreaded Eesa Somaulis were said to be in our camp, looking with longing eyes at our baggage, one of whom was pointed out, a stalwart savage, with an ostrich feather stuck in his hair, in token of his having killed his man. Therm. 3 P.M. 106 degrees; about 7 P.M. a violent dust-squall from the N.E. passed over us, blowing down the tent and dispersing all loose articles; it was followed by a short shower, after which the sky cleared and we had a cool and refreshing night.

June 23.—Halted this day at Koorandudah, most probably from a desire of our camel-men to spend a day with this detached portion of their own tribe; in the evening strolled down to the water ravine, where we saw great numbers of the rock rabbit (*Hyrax Abyssinicus*) playing about amongst the rocks.

June 24.—Turned out at 2 A.M., loaded the camels, and started at half-past 3, passed over rocky, broken, and stony ground, gradually sloping to the southward for a mile and a half, passing the group of bushes at Fiulloo; we then entered on the extensive plain of Kulallee, crossing it to the S.W. Skirting the base of a low undulating range of hills to the westward called Jibul Eesa, at daybreak we were able to judge of the full extent of this plain, the largest we have yet crossed; it appeared bounded by blue distant ranges of hills, the nearest apparently twenty miles off; the plain was a vast level of alluvial deposit, and covered with dry grass. At the eighth mile we came to some low rising ground to the eastward near the remains of some small Bedouin stone huts called Ulwulli, and afterwards passed several small low hills in the same direction. At this time the range to the southward kept gradually rising in sight, running, as all the others we had passed, N.W. and S.E.; it had a single lofty peak called Kuffal Ali. After two or three short halts, at 10 A.M. we reached the station of Borududa, having marched about fifteen miles. No water was to be procured at this station, and we received but bad accounts of our next halting-ground, which is said to be crowded with the different tribes and their herds, driven there by the great scarcity of water in all parts of the country at this season.

As usual, the ground near our camp was thickly strewn with basaltic pebbles, and in the neighbourhood were a few shrubby acacia bushes. We passed a hot dusty day, the wind coming in squalls from the N.E. From here the highest point of Kuffal Ali bore S.S.E., apparently forming a head-land extending some distance into the plain. We saw a large herd of cattle grazing on the plain, and were cautioned to be on our guard against horse stealers—a hint given rather too late —one mule having been stolen when out grazing yesterday evening. Thermometer at 3 P.M. 108 deg.; at night sky overcast and stormy, and a few drops of rain fell.

June 25.—Started at 4 A.M., and continued as yesterday to skirt the low Eesa range to the S.S.W., the road, after a mile or two, becoming shut in by low rounded hills to the eastward. After crossing the plain, for seven miles the road passed up a bushy dale, and then crossed over stony and rocky hills for three miles; we passed many herds of cattle and sheep on the road, all making their way in the same direction as ourselves, and on reaching the brow of the last hill overhanging Kilulloo, low white streaks of sheep and goats were seen descending the sides of the opposite mountain, whilst the lowing of cattle, and the bleat of sheep, rose from the ravine below. On descending into the hollow in which the water is found in pools of thirty or forty feet long, but very shallow, a most pastoral scene presented itself; thousands of sheep, cattle, and goats were collected in dense masses round the water; whilst women and men were bustling about, separating their flocks and driving them off to graze.

Kilulloo appears to be an important station to all the tribes for a considerable distance around, who, when the water fails in their own districts, drive their herds and flocks to this spot, where it is always to be found, though at this advanced period of the hot season it was of a wretched quality, black, muddy, and smelling and tasting strongly of the pollutions it receives from the numerous cattle which are here watered. It is found in pools extending along the bottom of a narrow ravine opening on to the Kulallee plain, and appears to receive the drainage of the southern portion of the Oobnoo range. We saw no habitations in the immediate vicinity, but were told that some of the numerous frequenters of the pools erect their temporary mat huts on the table-land to the southward.

We remained at this station five days, and had a good opportunity of observing the different tribes, of whom the Eesa with their bows and poisoned arrows were by far the stoutest and handsomest race; then came the Donakil tribes with their broad-headed spear and shield; and the Somauli with his lighter lance and smaller shield, all mixed promiscuously in the noisy crowd, and we saw no traces of those deadly and sanguinary feuds said to exist between them.

The constant tale of our guides has been of forays and deeds of arms between the different tribes; but on carefully noticing every shield borne by the men of our kafila, in number at least fifty, but one bears

the mark of having been opposed to a hostile spear, though most of them have the appearance of high antiquity. Whilst here we had a good opportunity of seeing the Donakil women; when young, many of them are good looking; in colour varying from the black of the negro to a dark brown. They wear their hair plaited very small, their features are generally pleasing and good humoured, the upper part of the body to the waist is usually quite exposed, the unmarried women wearing no covering, or only a white cloth over the head, whilst the married are distinguished by a head-dress of dark blue cotton cloth, which they occasionally draw across the breasts; the rest of their dress consists of a cloth or two, or leathern petticoat tied round the waist, and reaching half-way down the leg. They seem fond of ornaments; the more wealthy wear silver bracelets and anklets, and massive brass ear-rings, whilst large bead necklaces of many rows are in common use. Soon after passing the period of youth, the pendulous appearance of their breasts tends much to destroy the symmetry of their form. They were particularly free in their manners, and apparently rather lax in their morals and ideas of decorum, forming a striking contrast to the bigotry and jealousy of the people of the coast.

During the time we remained at this station, the leaders of our kafila, and several of the chiefs we met here, amongst whom were Ali Abi, Mohammed, Ali's father, his uncle, chief of the Rookhba tribe, Ibu Ibrahim, chief of the Eysomauli, and numerous others, passed the greater part of each day in solemn conference, arranging the affairs of the nation, and the more trifling concerns of our kafila, settling questions of precedence, and other equally weighty matters. These meetings seemed to be commenced and ended with prayer; when the object of the convocation had been arranged, which was generally after long and serious discussion, conducted with the greatest propriety and solemnity, all spears, until now erect, were laid on the ground, and a species of litany rehearsed by one of the assembly, each paragraph or prayer being followed by a deep hum of amen from the whole of the congregation. The assembly then broke up, and returned to their domestic avocations.

In such a motley collection from numerous tribes, there were, of course, occasional quarrels, on which occasions the creese was usually drawn; but the valiant disputants were invariably separated by the bystanders in time—save on one occasion, when a man of our kafila received a cut on the head from a creese, having indiscreetly entered into a quarrel when rather distant from his companions.

As usual, the various chiefs were introduced to the mission, and presents exchanged; theirs consisting of bullocks and sheep, ours of scarlet superfine cloth for mantles, razors, and other articles. Their followers were also to be propitiated, and great was the consumption of tobacco and blue cotton cloth,—the latter being folded by the receiver into the shape of a small triangle, and carried about in a cleft stick. For writing paper there was also a great demand, and the doors of our

tent were daily crowded with applicants for "wurkut," (paper,) to be applied to the purpose of receiving a magic spell, and being worn as amulets. We found here, on our arrival, a kafila belonging to the son of the Kazee of Tajoora, with about twenty slaves, none of them above the age of twelve or fourteen; they had arrived from Shoa in sixteen days, bringing letters from Mr Krapf, dated 8th June, and expected to reach the coast in eight or ten days. Having just passed over the same desolate route, we can form an idea of the sufferings and hardships these poor children will have to undergo before reaching their destination. By this opportunity we forwarded a packet of letters for Bombay. The weather during our stay was very hot, as we were shut in on all sides by black basaltic rocks, and all air excluded from the tent by the swarms of prying savages, who seldom left us save during meal times, when they always retired. The thermometer generally rose during the day to 108 deg.; the afternoons, however, were generally overcast, and the nights very cloudy. On the 26th, we had a slight shower at night, quite sufficient to make us uncomfortable, as we were sleeping in the open air,—Esak not allowing our tent to remain up during the night, lest the Bedouins should be tempted by such a display of white cloth to cut it to pieces. On the 27th we also had a few drops, but the night passed off pretty well. On the afternoon of the 28th the sky was very cloudy, and about 8 P.M. heavy rain set in, and continued at intervals during the greater part of the night; fortunately we had pitched a small waterproof tent, which, with some tarpaulins, gave a tolerable shelter, notwithstanding which we passed a wretchedly uncomfortable night, but were in some measure compensated by the coolness of the following day,—the thermometer at daybreak being only 77 deg., and maximum during the day 94 deg.

Lieutenant Barker's observations make the latitude of Kilulloo 10 deg. 34 min. 33 sec. N., and by thermometrical observations its height above the level of the sea was found to be 1542 feet. On the evening of the 29th everything was declared to be settled, a last solemn kuttam having been held to decide which road we were to take; the upper one generally travelled by kafilas and passing through friendly tribes, it appears is nearly destitute of water; the lower, or Badoo road, is better supplied, but infested with Gallas and Mudaitos, and has not been traversed by the Donakil merchants for years; however, trusting to the strength of our party, they have determined to attempt it, and to-morrow we start.

June 30.—After a quiet night without rain, our kafila at last got under weigh, and we started at 7 A.M., our road passing up the Kilulloo Waddy, in which we found frequent pools of water. Leaving the course of this valley, we then struck over rising ground and low undulating hills, both plentifully strewn with the common pest of this country — stones, amongst which we found many small pieces of obsidian. After a short march of seven miles, during which we have ascended considerably, we found the advanced part of our kafila en-

camped in a small hollow called Warimillee, surrounded on all sides by low hills; our supply of water was obtained from the Waddy Kilulloo, about a mile and a half distant, in which, after the rainy season, crocodiles are said to be found.* Height of Warimilee above the sea was found to be 1752 feet. The night was very squally and blowing, but passed over without rain.

At Warimillee we were joined by a messenger bringing a packet from Tajoora, containing a most welcome collection of letters and newspapers containing English news to the 4th May—a period of less than two months.

July 1.—As Esak is still doubting, and evidently dislikes proceeding by this route, we halt to-day to await the return of two men who have been sent to report on the supply of water on the upper road; on their arrival, they announced that they had found all the pools empty, so we must needs face the Gallas, who cannot prove greater thieves than our present friends, much pilfering having lately taken place.

July 2.—After a quiet night, without rain, started at half-past 6 A.M., crossed to the W. and S.S.W., over low stony hills, on which we found several flocks of sheep grazing, then came to a small cluster of beehive-shaped huts made of matting, from whence we descended into a small valley named Doomi, apparently a branch of Waddy Kilulloo; we passed along its eastern side for two miles, then crossed it, and ascended the opposite low hill on to a level table-land covered with dry grass; passing over this for five miles, we reached a low projecting hill, having a cluster of huts or village called Koriddra on its point; continuing our course another mile to the westward, we halted under a second low point called Nagakoomi; no water was to be found, but there was abundance of grass for our cattle.—Marched fifteen miles. A mountain range was visible from here, extending from N.W. to S.W., and distant about twelve or fifteen miles, called Jibul Pfeeo; the intervening district appeared a perfect desert, save where the view was broken by a range of low bushy hills. At 4 P.M. we had heavy rain for half an hour, and at night much lightning to the southward and eastward.

July 3.—Commenced loading camels at 4 A.M., and started at half-past 5; passed to the westward over broken and jungly ground for a mile, when the hills closed in, and our route ran through a narrow valley, having much grass, and an unusual number of fresh green-looking bushes; ascending from this valley, our road ran S.S.W. over a jungly and stony plain, the hills still basaltic, and the ground

* Messrs Scott and Bernatz, who accompanied the second detachment of the mission, saw a great number of these animals in the shallow pools of Kilulloo, in December 1841, the largest being about six or eight feet in length. It is a curious question where they migrate to on the approach of the dry season, the nearest permanent stream being the Hawash, forty or fifty miles distant; or their reason for deserting this river after the rains.

strewn with fragments of obsidian. At the tenth mile we came to a fine green-looking patch of bushes, called Arnoot, a most refreshing sight; herds of cattle and flocks of sheep were grazing in the neighbourhood, and we here found some pools of muddy water, which, as usual, our thirsty cattle rendered still more undrinkable by rushing into the centre: by all accounts we have to thank the last few nights' rain for this most welcome supply. After watering the cattle we again pursued our journey, and soon entered a long narrow valley, bound in by low sloping hills, which, with the bed of the valley, were thickly clothed with dry grass; proceeding along this for five miles, we came to some pools of muddy water called Meinhatolli, near which numerous cattle were grazing, and here we encamped at half-past eleven, having marched fifteen miles. To the south-west the valley appears to open on to an extensive plain, beyond which several detached peaked mountains are in sight. We found that to-day we had struck into the upper road, as the rains having fairly set in the pools on this route were expected to furnish a sufficient supply for the kafila. The lower road, we learned, passes over the Pfeeo range, and runs to the northward of Jibul Aiulloo.

The water here we found very bad and dirty, and smelling very strong of the dunghill. Heavy rain, with thunder, lightning, and severe squalls, set in about seven in the evening, causing much confusion and discomfort. The Donakil seems to bear the rain most patiently; lying on one mat with another drawn over him he seems careless of the drenching shower; not so our servants, who suffer much from it, and are becoming heartily disgusted with the journey: one severe gust brought down our tent, escaping from the wet folds of which we were happy to take refuge under the tarpaulins; the rain stopped at 9 P.M., though the sky still continued cloudy, and the moon shed but a dull and flitting light on our drenched camp.

July 4.—Commenced loading at 4 A.M. When on the point of starting, our messenger, despatched to Shoa from Ankober on the 23d May, made his appearance; he arrived at Ankober on the 20th June, and left on the 22d; he brought a letter from Mr Krapf, from which we learned that his majesty of Shoa had started on a campaign against some rebellious Gallas. Commencing our day's journey about five, we passed through the valley for a mile, and then emerged on the fine extensive plain of Meerihan, bounded to the northward by the lofty peaked range of Pfeeo; to the eastward by the sloping Bundoora range, along the base of which our road ran to the S.S.W. the whole day: in height it varied from six hundred to one thousand feet; its sides thickly clothed with grass. Five miles from our halting ground we came to a singularly small detached hill of hard compact fresh water limestone, containing a few impressions of small spiral shells; the surrounding rocks were as usual of cellular basalt. The plain was covered with a fine light coloured soil, strewn with small fragments of obsidian; stones not so plentiful, and the grass much improved by the late

showers, and acquiring a greenish tint. At the ninth mile we came to the entrance of a ravine, called Waddy Bundoora, from which a small nullah issues, and runs through a patch of fine verdant bushes, promising a supply of water which was expected to be found here, but every pool was dry, and we had to continue our route. A low range of hills to the westward commenced near here, and continued parallel with our course. Another five and a half miles brought us to a second clump of green bushes, called Madeera Dubba; no water was to be found, but having come fifteen and a half miles, and the heat becoming oppressive, we pitched our camp for the day. In the evening the sky clouded over, and we had several very heavy showers, with much lightning.

July 5.—Started shortly after 3 A.M. A fine cool, fresh, moonlight morning, a great change of climate from the Bahr Assal, and warm clothing, for the first time, was much in request. Passing seven miles S.S.W. down the valley we came to a small black lava hill, situated at the point where the low undulating hills of the Bundoora range tend to the S.E., towards the mountains of the Ittoo Galla; from the summit we obtained an extensive view over the surrounding country, which bore an extraordinary volcanic character. To the westward was the lofty crater of Jibul Abida, partly hid by clouds; near it was the smaller but loftier cone of Aiulloo, beyond which the blue range of Habesh was dimly visible, whilst numerous small volcanic cones were scattered over the plain from the west to south-west. To the south-east was the extensive valley of Kordeite, running up between the Bundoora and Koonni ranges, said to be the nearest road to Error, and extending as far as the Galla mountains.

Continuing our route, we crossed a small deep nullah, bordered with a green bushy jungle, and came to a few puddles of muddy water on the road, to which our cattle at once made a rush; we here saw a hog, some guinea and spur fowl, in the jungle, and a few quail in the surrounding grass. Our course now ran S.S.W. towards a remarkable conical hill; at the eleventh mile we passed a cluster of stone sheep-pens, and then proceeded over a fine open plain, with grass and lava stones in great abundance. At the thirteenth mile we reached the hill, which proved to be a volcanic cone, called Jibul Helmund, about 400 feet in height, having a crater opening to the N.E. Its base was surrounded by a broad belt of lava, about three miles in diameter, forming a wall towards the plain from fifteen to twenty feet high, the crevices of which were swarming with guinea fowl: passing round the lava belt to the eastward, we came in sight of a remarkable plain, called Sooltulli, on which a herd of camels was grazing; it was entirely covered with low shrubs, giving it a pale green tint, exactly resembling a lake covered with duck weed, the similitude being greatly increased by its being a perfect level; indeed, during the greater part of the year it is covered with water, and our guides here expected to find a supply, but were disappointed, and we were doomed to rest contented with the nauseous

contents of the skins filled at Meinhatolli. Crossing the flats about a mile, we encamped at half-past ten, after a march of seventeen miles, at the foot of the low Koomi range. The country in sight from this station is of a most interesting description. To the westward the extensive volcanic crater of Abida, the diameter of the upper margin of whose yawning cup must be, at least, two and a half miles, rises over numerous smaller cones scattered on the plain below, each having an elevated belt of black lava at its base; the loftier towering cone of Aiulloo, by the Abyssinians called Azullo, was just visible behind the southern point of Abida. The country around the bases of the larger volcanoes, for miles, was one sheet of lava, studded with smaller cones, of which from one point of view we counted twenty-one. None of them appear to have been lately in action, nor could we discover any tradition relating to their volcanic origin. Ibrahim Shem, indeed, stated that he had seen Abida burning when passing twelve years ago; but, on further inquiry, it proved to be merely the grass on its surface. From here, also, we had the first distinct view of the lofty blue range of Abyssinia, to the westward. As usual, we had heavy rain at night, setting in about 9 P.M.

July 6.—In consequence of last night's rain every tent and package had become so heavy that we were obliged to halt until noon, by which time they had become sufficiently dry to allow the camels being loaded, and we started for Murow, the day being pleasantly cool. Shortly after leaving our ground, we discovered a small puddle of water, at which our cattle drank, and we then continued our course for three and a half miles along the base of the Koomi range, passing over a bare alluvial plain resembling the Scinde deserts, and leaving a volcanic cone about two miles to our right; we now reached a few acacia trees, small, but still almost the first vegetation exceeding a shrub we had seen on our journey. The adjacent plain is called Mittur, and this spot Ras Mittur, being the point where the two roads from Kilulloo meet. Our road from this spot struck off from the hills, (which continue S.S.W. towards Jibul Afrubba,) and ran across the plain in a W.S.W. direction, having the edge of the lava plain to the northward, the fresh green hue of the bushes with which this tract is studded proving the fertile quality of the decomposed lava. Eight miles and a half from Sooltulli we came to a low black hill, near which, on the plain, a fine herd of milch camels were grazing, and two miles beyond this reached a small group of about twenty Bedouin huts; from this point the lava plain tends towards the W.N.W. At the eleven and a half miles we came to a narrow tract of jungle, passing through which the plain again opened, and was studded with flocks of sheep and goats; dense clouds of smoke were seen ascending from the country ahead. Proceeding a short distance further we arrived, at half-past 5 P.M., at the Pool of Murow, surrounded by low hillocks. We found the water very good, and far better than any we had tasted since leaving the Bay of Tajoora. The pool was about a quarter of a mile in diameter, and

full of leafless bushes, whilst numerous waterfowl were sailing on its surface. Being weary with our day's march we retired early to rest; but, much to every one's discomfort, had heavy rain during the night.

July 7.—About 9 A.M. two horsemen, wild looking beings, rode into camp, and on account of some intelligence received by Esak, we were to-day put in fighting order. It seems that a large body of the Mudaitos inhabiting the country about Jibul Abida have started on an expedition against the Itto Gallas, who reside in the tract near Jibul Afrubba, and were to arrive at the watering-place of Murow this day; and in corroboration a small advanced guard of about fifty men came up just as we were starting. As it was imagined that the plunder of our rich kafila would offer a temptation they could not resist, every precaution was taken to avoid meeting them. We started at eleven A.M., and, striking off the high road, pursued a course more to the southward, an advanced party going ahead to feel the way, who every now and then climbed a lofty tree or termite's nest to obtain a more extensive view. Our party was kept in a body, in advance, with every gun loaded, whilst our Donakil escort protected the rear. In this order we proceeded for ten miles across the plain of Mooloo, passing to the W.S.W., through a fine level tract covered with fine dry grass and studded with verdant bushes, over-topped occasionally by the fine cedar-like camel thorn. The scenery was very fine, when through an open glade the view extended to the fine peaked range of mountains near Afrubba.

At the tenth mile the plain became more open, and we were here halted on the intelligence being received that a party of Galla horsemen were in sight at a distance, who, however, on a survey with our telescopes, proved to be only a few ostriches scudding across the plain; confidence being restored to our Adel companions, we proceeded on our way. The country we had passed through was swarming with game; antelopes of several species fled across the path on our advance; under every bush were coveys of guinea and spur fowl, with occasionally a bustard or florican; whilst from the grass as we passed through, a hare or quail would be started at every hundred yards; but, alas! in this fine show of game, the first we had seen, not a gun was allowed to be discharged, lest its discharge should draw the attention of the dreaded Mudaitos on our track. At the twelfth mile we came to some small muddy streams about four feet in breadth, through which the water has just commenced to flow from the southward; they were called the Mooloo tani, "or the other Mooloo," the large Waddy Mooloo running at the foot of the hills under Jibul Farsis, a double-peaked mountain near Afrubba. Our kafila people congratulated themselves that they were not a few days later, as this part of the plain would soon be overflowed and become a complete swamp, very difficult to be passed by camels. In this neighbourhood the grass had been burnt for a considerable distance, and from this spot the smoke we saw on yesterday's march must have arisen. Passing on,

we came to a beautiful patch of green grass just sprouting from the soil, on which our jaded cattle luxuriated for a few minutes. Near the margin of the grass we found the recently picked skeleton of a beizu, the straight horns of which measured 32 inches, most probably killed by a lion, as the footmarks of one had been seen on the road. Proceeding a short distance further we halted at a quarter to 5 P.M., after a march of thirteen miles, near a termite's nest, under which was an extensive excavation, said to be the tenement of a wild hog; we fired a few shots into it, but it proved to be without inhabitant. Our camp was formed in the open plain, with a clear uninterrupted view all round, to prevent surprise, and the night passed away without rain or Mudaitos.

July 8.—Started at half-past 4 A.M., and proceeded W.S.W. towards a small barn-shaped hill at the termination of the Borduda range, which extends south-westward from the elevated tract about Jibul Abida. We passed the small bed of the Waddy Borduda about half-way, and at five and a half miles came to a group of eight graves, two of which, apparently of men of note, were enclosed in a fence and covered with dry twigs; after another mile we reached the barn-hill, where our Bedouin escort, who were in advance, each plucked handfuls of foliage from the surrounding bushes, with which on passing the point of the range they adorned the grave of a celebrated Bedouin, Sheik Othban, with hasty prayers and cries of "Sheik Othban! oh, Sheik Othban!" Passing from hence about two miles, we came to some pools of good water in the bed of a stream close to a fine camel-thorn with most picturesque foliage, and pitched our camp on a rising ground above called Borduda, commanding a fine view over the Mooloo plain, which appeared to vary from twenty to thirty miles in breadth, bounded to the east by the Koomi range, to the south by the mountains Afrubba and Assiboti, and to the north-west by the Borduda range. We again saw much smoke in the evening in the direction of Mooloo tani. The mountains of Habesh to the westward are becoming much more distinct in their outline, but appear still very distant. The thermometer at daybreak stood at 68 deg., but, although the day was cloudy, at 3 P.M. stood at 105 in the tent; no rain fell during the night.

July 9.—Started at 5 A.M., and passed over low hills for a mile and a half, and then descended in to the Halakdugi Kubeer plain, a continuation of the Mooloo, extending to the southward to the Assiboti mountain and range of the Itto Gallas, and to northward round the western side of Jibul Aiulloo and Abida: the plain is an alluvial level thickly covered with grass, and having but a scanty sprinkling of low shrubby bushes without any trees. We crossed it for twelve and a half miles to the westward—a most uninteresting tract—but enlivened by a few antelopes, some beizu, a herd of zebras; and our Bedouins having caught sight of a leopard, started in chase, following it up on foot and quickly gaining on it, when it ran to the cover of a bush, from whence

they forced it and soon after finished its career on the plain with their spears, which they decorated, as also their shields and necks, with thin strips of the spotted skin of its tail.

At twelve and a half miles we reached the edge of a sloping descent of about thirty feet, and entered the valley of Halakduggi Sugere, which one of the Adel also called the "Large Hawash;" it was about two and a half miles in breadth and bounded by similar parallel banks on the opposite side; its surface was perfectly level and covered with fine grass; from its winding course, apparently running from the high range of the Itto mountains towards the Aiulloo volcano to the northward, it has every appearance of having once been the bed of a considerable river—perhaps, a former channel of the Hawash, turned into its present course, at the time when the extensive volcanic tract around Abida was in an active state, and when subterranean influences must have much altered the face of the country. In the valley we saw three wild asses and a couple of beizu. Ascending the western bank we passed over three successive terraces, each raised about fifty feet above the other, and descended from the last into a confined valley called How; we could not ascertain the exact meaning of this name, but were told it had acquired it from the many Bedouins who have been here surprised and cut up by parties of the neighbouring Gallas. We here encamped at 11 A.M., having marched about fifteen miles. On ascending a small hill to the southward, we had a fine view across the valley of the Hawash, and the lofty range of Abyssinian mountains: we could not see the river, but its course could be traced by a dense belt of trees running nearly north and south; the intermediate country was but thinly wooded, and we saw a fine herd of cattle grazing on the plain. No water was to be obtained at this station. On this day's march, two mules were obliged to be deserted, and several of the horses were with difficulty brought on; these poor beasts have had a most distressing journey, seldom getting water on two successive days, and frequently a very scanty supply of grass, and have now, most of them, become perfect skeletons. We passed a hot day here, being much shut in by hills; the evening was cloudy, and we had heavy rain with thunder and lightning at night.

Lieutenant Barker's astronomical observations place this station in lat. 9 deg. 39 min. 13 sec. N.

July 10.—Started at 6 A.M., and passed S.S.W. along the face of the hill, which is of wacke formation, descending several sloping terraces for three miles, when we reached the level of the Hawash plain, crossing which to the S.W. for six miles, latterly winding much from the denseness of the jungle, we reached the banks of the Hawash and encamped at half-past nine on a low hill near the river. The first six miles of this day's march were through a thinly-wooded district; but as we approached the stream, the country became more thickly clothed with fine picturesque camel-thorns and other forest trees, beneath which

we saw marks of the rhinoceros and elephant—the dung of the latter was very plentiful, and the trees bore evident marks of their visits in their shattered branches.

With the Hawash itself we were much disappointed ; its breadth was about forty yards, with a depth of ten or twelve feet, and its stream ran at about three miles an hour ; the banks in parts thickly wooded with overhanging willows, were at least twelve feet above the present level of the river, and our guides stated, that after heavy rains the level country on each side is overflown for miles ; at this season it can usually be forded, but the muddiness of the stream showed that its waters had been much swollen by the late rains. Its course ran from the southward, and the lofty country of the Itto towards the north, where it passes to the westward of Jibul Aiulloo, and is said to be finally lost in the lakes at Oussa.

By the boiling point of water, the level of the river at this station was found to be 2223 feet above the sea.

The afternoon was passed by our camelmen in preparing rafts to convey the baggage across the river. Our camp was enclosed with a fence of thorny bushes to guard against wild beasts ; but we received no visit from the denizens of the forest, and passed the night without rain or other annoyance.

July 11.—At daybreak, proceeded to the river bank to see what progress had been made ; found ten rafts nearly ready for launching, composed of two layers of drift-wood, under which were lashed about a dozen inflated water-skins, rendering them perfectly buoyant and capable of carrying over two camel loads each trip ; a rope was next passed to the opposite bank and made fast to a tree ; all being prepared, the work of transporting the baggage to the opposite bank of the river commenced, and by the evening everything, as also the camels and mules, were on the western bank, with the loss of one camel only, which was drowned. A raft with three of the European escort on it upset in the river ; but the accident was attended with no more serious consequence than the loss of two muskets and their ammunition.

It was a hard day's work, and the camelmen laboured most steadily. Being the greater part of the day in the water, all clothing was discarded, and they worked in a state of perfect nudity.

On crossing the river we proceeded to a small lake or pond encircled by low hills. Its size was about a quarter of a mile long by 300 yards broad. Its clear waters were inhabited by numerous hippopotami, who frequently rose to the surface of the water, and their loud snorting very much resembled that of a horse, accounting, I imagine, for their otherwise misapplied name of the river horse. Their heads had a most imposing appearance for so harmless an animal. Many shots were fired at them, but they showed themselves so cautiously above water, that, though several were hit, none were killed. We also saw several crocodiles, but none of them of large size. Elephants and lions were said to be abundant in the neighbourhood ; but we saw neither, though one of

the soldiers came running in from the jungle after dusk, stating that he had fallen in with an elephant three times the height of a horse. Our old dhobee's donkey here died, after an attempt to expel the water he had swallowed during his passage of the river, by suspending him by the hind legs from a tree; after five minutes of which discipline, he was taken down apoplectic, and, spite of a copious bleeding, expired. At night his body was placed on an open space near our camp, and about midnight was discovered by a party of hyænas, whose demoniac laughter over this sumptuous banquet continued during the remainder of the night; but we were disappointed in our hopes of shooting one by their dragging the body to a distant bush.

A fire was kept burning near the cattle, and the night passed away without any annoyance from wild beasts, but not without our usual share of drizzling rain.

July 12.—At daybreak no remains of the unfortunate donkey were to be found, though the ground was deeply marked by the night's revels. We started from the Hawash about 6 A.M., rounding the north end of the Hippopotamus Pond, passing near the village of Melkakooia, and then over a mile of stony hilly ground, when we came to the lake of Hulabaloo, prettily situated in a green hollow, apparently the basin of an extinct crater. It is about the same size as the Hippopotamus Pond, but circular. Its waters are saline and sulphurous, as was plainly evinced by the smell, and, though not drinkable, are highly prized for their bleaching properties, as was testified by the clean appearance of the dress of those of our Donakil friends who availed themselves of its qualities. Passing the lake, our road lay over a grassy plain, shut in by conical hills of no great elevation, but of a decided volcanic character, the craters of several of them being very apparent: the neighbouring hills and rocks, wherever they showed above the soil, were of black lava, and appeared to extend over a surface of about eight miles in diameter.

At the eighth mile the Lake of Leeado appeared in sight to the southward; and as some Bedouins had reported that elephants had been seen there at daybreak, we struck off the road and proceeded to its banks; it is a pretty lake of good water, about two miles in diameter, bordered by jungle, its margin covered with the lotus flower, and teeming with geese, ducks, flamingo, and other aquatic birds, but no elephants were to be seen. We halted for a short time near a group of huts on the bank, from which the Bedouin women were driving down their flocks of sheep and goats as we approached.

Returning to the road, and passing over a bare, open plain without grass, for three miles, we reached two small stone enclosures, in which poles were erected, from which were suspended the stuffed skins of two lions' heads, speared at this spot some years since by the Bedouins. Passing a small group of huts, we at length at noon, after a march of 12½ miles, reached the small Waddy Asboti, in which we found a plentiful supply of water, though there was very little grass in the vicinity

for our cattle. An antelope, and several partridges and ducks, were shot on the march. During the day, which was very hot and close, a swarm of locusts passed over, apparently shaping their course to the mountains of Habesh: about forty adjutants kept soaring in the air over them, or, alighting on the ground, made prize of them as they fell.

From this station we had a fine view of the lofty mountains of Shoa to the westward, rising range beyond range, and canopied with clouds. The situation of Ankober was pointed out near the summit of a conical hill. The most distant range, or Chaka mountains, must be of great elevation, far exceeding that of Ankober. At night we had very heavy rain, and were nearly flooded in our tents.

July 13.—A fine, cool, cloudy morning; started at half-past six, and passed for six miles over the Asboti plain. As yesterday, it was nearly destitute of grass, and thinly wooded—the fine spreading camel thorns forming the most striking object in the scenery. We passed a short distance along the Asboti Waddy, running from the mountains towards the Hawash, but at present containing no water. Soon afterwards, the hilly country at the foot of the Abyssinian range commences, passing over hill and dale, thickly wooded with a great variety of timber, camel thorns, acacias, and tamarisk, the under surface completely covered with the aloe plant, which here grows most luxuriantly. At the tenth mile we came to the pebbly bed of another mountain stream, called Waddy Kokai, running to the eastward towards the Hawash; our road ran along its bank, and then through its bed, in parts shut in by precipitous basaltic cliffs. Notwithstanding last night's heavy rain, we found no water in its bed until we reached Dathara, a distance of 12½ miles from Asboti, where we drank at the first clear crystal running stream we had tasted on the journey. We here spent the greater part of the day under the shade of the surrounding trees. The day was cloudy, and more resembling a fine summer's day in England than one of July in the tropics. Our elevation was here found to be 2944 feet above the level of the sea.

July 14.—Halted by orders of the Woolusma Mahomud, the first Abyssinian potentate we have met with, and chief of the Mahomud districts of Efat.

July 15.—Started at half-past six A.M., escorted by the Woolusma Mahomud and about two hundred of his people, the road gradually ascending, and passing through a hilly and wooded country abounding with the aloe plant, and having deep valleys extending to the north and south. At the fifth mile we came to the first cultivated ground, and shortly afterwards encamped on a small open space called Dinomali, the frontier station of Abyssinia, where the duties on articles arriving by the Adel Kafilas are levied. Notwithstanding the elevation we have now attained, the day was very hot.

July 16.—Crossed a hilly tract, with occasional patches of cultivation, to Farri, a distance of one and a half mile. This is the first Abyssinian village we have seen. It is principally inhabited by Moham-

medans. The houses are of a circular form, with conical roofs, and generally perched on the summit of the surrounding hills. We here spent a hot, close day, much incommoded by the numerous visitors whom curiosity had brought to the spot.

July 17.—Started for Alioamba, escorted by a party of three hundred Abyssinian matchlockmen, the baggage being carried by porters, the road being too mountainous for camels. We passed over a low point to the southward of Farri, and then along a valley winding to the south-west, passing for some distance along the precipitous edge of the hill, and then descending into the bed of a fine mountain torrent, the appearance of the country becoming most verdant, and very extensively cultivated—villages being perched on most of the small peaked hills. At the fifth mile, we passed through a gorge in the range near Goncho, having to the eastward a steep precipitous hill, with Aigibba on its summit—the first Christian village, and the spot where the late Mr Airston is buried. We then entered the triangular space immediately below Ankober, bounded to the north by the spur projecting from the lofty peak of Emumaret to the south by a range commencing at the projecting peak of Losa, the base between these points being about ten miles. The road winding to the south-west passes over a mountainous tract, through narrow valleys, and over successive ranges of hills, crossing the beds of two mountain streams; the country highly cultivated, each rounded hill being crowned with a small cluster of cottages, the vegetation most luxuriant, and approaching in character to that of Europe.

After a delightful march of thirteen miles we reached Alioamba, a large straggling village, principally inhabited by Mohammedans, built on the extremity of a spur projecting from Ankober, having a small stream running through the Lomi (lemon) valley at its foot. It was determined by the boiling point of water to be 5271 feet above the level of the sea.

From Alioamba the road to Ankober runs for some distance along the crest of the ridge, and then winds to the westward, with a very steep ascent in parts, for about five miles, to the summit of the mountain range running north and south, on two elevated hills, of which the town of Ankober, the capital of Shoa, is situated. The northern hill is strongly palisaded, and exclusively occupied by the residence and numerous outbuildings of the Negoos; the southern, by the town, in appearance densely wooded, each cottage being surrounded by a bushy fence nearly concealing the houses.

Ankober, by the mean of numerous observations, is in lat. 9° 35′ North, and long. 39° 54′ east, and the boiling point of water makes its elevation 8200 feet above the level of the sea.

APPENDIX.

No. I.—*Route from Tajoora to Ankober.*

Date of Arrival.	Station.	Miles. Marched.	Water.	Elevation above level of sea.	Latitude.
1841.					Lat. 11·46·35 N.
May 17,	Tajoora,		Plentiful		Long. 43· 0·20 E.
30,	Ambaboo,	3½	do.		
June 1,	Dulool,	7	do.		
3,	Sagalla,	2½	do.		Lat. 11·40·15 N.
5,	Warilissan,	14	None	1697	
6,	Mooya on Salt Lake,	16	do.	[570 below level of sea.	Lat. 11·37·30 N. Long. 42·33· 6 E.
7,	Goongoonta,	16	Plentiful		
9,	Ulooli,	9	do.	228	
11,	Bedikuruof,	16	In pools		
12,	Sugadara,	8	do.		Lat. 11·19· 3 N.
13,	Murrah,	4	Distant		Lat. 11·17· 3 N.
14,	Daduh,	·15	In pools		
15,	Gobat,	12	In river bed	1057	Lat. 11· 0·54 N.
17,	Sunkul,	4	In wells		
18,	Sugageedan,	7	None		Lat. 10·53· 0 N.
19,	Dahwailaka,	9½	Plentiful	1228	
20,	Oomurgoolf,	8½	None		
21,	Amadoo,	7½	Plentiful		
22,	Koorandudah,	3½	do.	1605	
24,	Borududa,	15	None		
25,	Kilulloo,	12	Plentiful	1542	Lat. 10·34·33 N.
		190			
30,	Warimillee,	7	Distant	1752	
July 2,	Naga Koomi,	15	None		
3,	Meinhatolli,	15	Scarce & bad		
4,	Madeera Dubba,	15½	None		
5,	Sooltulli,	17	do.		
6,	Murow,	13	Good & Plen.		
7,	Moolootani,	13	None		
8,	Bordudah,	9	Plentiful		
9,	How,	15	None		Lat. 9·39·13 N.
10,	Banks of Hawash River,	11	Plentiful	2223	
		320½			

Date of Arrival.	Station.	Miles. Marched.	Water.	Elevation above level of sea.	Latitude.
July 12,	Asboti,	12½	Plentiful		
13,	Dathara,	12½	do.	2944	
15,	Dinomali,	5	do.		
16,	Ferri,	1½	Distant		
17,	Alioamba,	13	Plentiful	5271	
August 4,	Ankober,	5	do.	8200	Lat. 9·34·45 N.
Distance from Tajoora to Ankober, . .		370 miles.			

Number of days occupied in the journey from Tajoora to Alioamba, ... 48
Number of marches, ... 35
Halts, ... 13
Days without water, ... 10

Distance to Ankober, ... 370 miles.
Marches to do., ... 36
Average number of miles marched per diem, . . 10·3

R. KIRK, Assistant Surgeon,
Attached to the Embassy to the Court of Shoa.

No. II.—*Astronomical Observations taken by Lieut. Barker, I.N., between Tajoora and Ankober.*

June 6. 1841—Artificial Horizon.

Double Merid. Altitude * Benetnach, . .	103·8·0	
	4·30	I. E.
	2)103·3·30	
Mooya near Bahr Assal Salt Lake, . .	51·31·45	
	·45	Refrn.
	51·31· 0	
	38·29· 0	
	50· 6·29	Decln.
Latitude,	11·37·31	N.

June 12, 1841.—Artificial Horizon.

Merid. Altitude * Benetnach, . . .	102·30·50
	4·10 I. E.
	2)102·26·40
Sagadara, ...	51·13·20
	·46 Refrn.
	51·12·34
	38·47·26
	50· 6·29 Decln.
Latitude,	11·19· 3 N.

June 13, 1841.

Obsd. Merid. Altitude * Benetnach, .	102·26·50
	4·10 I. E.
	2)102·22·40
Murrah, ...	51·11·20
	·46 Refrn.
	51·10·34
	38·49·26
	50· 6·29 Decln.
Latitude,	11·17· 3 N.

June 15, 1841.

Obsd. Merid. Alt. * Benetnach, . .	101·54·30
	4·10 I. E.
	2)101·50·20
Gobat, ...	50·55·10
	·46 Refrn.
	50·54·24
	39· 5·36
	50· 6·30 Decln.
Latitude,	11· 0·54 N.

June 18, 1841.

Obsd. Merid. Alt. * Benetnach,	101·38·40	
	4·10	I. E.
	2)101·34·30	
Sugageedan,	50·47·15	
	·46	Refrn.
	50·46·29	
	39·13·31	
	50· 6·31	Decln.
Latitude,	10·53· 0	N.

June 25, 1841.

Obsd. Merid. Alt. * Antares,	106·46·30	
	·3·15	I. E.
	2)106·43·15	
Kilulloo,	53·21·38	
	·42	Refrn.
	53·20·56	
	36·39· 4	
	26· 4·37	Decln.
Latitude,	10·34·27	N.

June 25, 1841.

Obsd. Merid. Alt. Jupiter,	115·28·20	
	3·15	I. E.
	2)115·25· 5	
Kilulloo by * Antares, 10·34·27	57·42·32	
by Jupiter, 10·34·39	·35	Refrn.
66	57·41·57	
Mean Latitude, 10·34·33 N.	32·18· 3	
	21·43·24	Decln.
Latitude,	10·34·39	N.

July 9, 1841.

Obsd. Merid. Alt. * Antares, . . .	108·40 20
	7·12 I. E.
	2)108·33· 8
How, ...	54·16·34
	41 Refrn.
	54·15·53
	35·44· 7
	26· 4·37 Decln.
	Latitude, 9·39·30 N.

July 9, 1841.

Obsd. Merid. Alt. Jupiter, ...	117·40·20
	7·12 I. E.
	2)117·33· 8
How, by * Antares, 9·39·30	58·46·34
by Jupiter, 9·38·56	·34 Refrn.
2)19·18·26	58·46· 0
Mean Latitude, 9·39·13 N.	31·14· 0
	21·35· 4 Decln.
	Latitude, 9·38·56 N.

August 8, 1841.

Obsd. Merid. Alt. * a Lyræ, ...	122· 3·20
	8·44 I. E.
	2)121·54·36
Ankober, ...	60·57·18
	·32 Refrn.
	60·56·46
	29· 3·14
	38·38·29 Decln.
	Latitude, 9·35·15 N.

September 21, 1841.—Ankober.

Obsd. Merid. Altitude Moon's upper limb, . 106·47·30
8·44 I. E.

☽'s Merid. Passage 5·9·18 ☽ corrd. H.P. 55·10 2)106·38·46
6·
53·19·23
5·3·18 Parallax in Alt. 32·14 32·14 P. in Alt.
Longitude in time 2·39·30 53·51·37
Greenwich time, 2·23·48 15·15 ½ Diameter.
½ Diamr. noon, 15· 2 53·3 6·22
·13 36·23·38
½ Diameter, . 15·15 26·49· 2 Declension.

Latitude, 9·34·36 N.

November 18, 1841.—Ankober. ⊙

Obsd. Merid. Alt. Sun's Lower Limb, 121·48·40
Lat. by * a Lyræ, 9·35·15 ·50 + I. E.
... by Moon, Mn. Alt. 9·34·36 2)121·49·30
... by ⊙ Merid. Alt. 9·34·24 60·54·45
·27 Refrn.
3)·104·15 60·54·18
Mean Latitude of Ankober, . 9·34·45 N. ·16·13 ½ Diameter.
61·10·31
28·49·29
19·15· 5 Corrected Decln.

Latitude, 9·34·24 N.

Astronomical Observations, by Assistant-Surgeon R. Kirk.

October 13, 1841.

Obsd. Merid. Alt. * Fomalhaut, . 99·57· 0.
1· 4 I. E.
2)99·55·56

Ankober, ...	49·57·58	
	·48	Refrn.
	49·57·10	
	40· 2·50	
	30·27·27	Decln.
	Latitude, 9·35·23	N.

November 9, 1841.

	⊙	
Obsd. Merid. Alt. Sun's Lower Limb,	126·34·40	
⊙ ½ Diameter, 16·11	2· 5	I. E.
Refrn. . . . ·24		
	2)126·32·35	
15·47	63·16·18	
	15·47	
	63·32· 5	
Ankober, ...	26·27·55	
	16·52·52	Corrected Decln.
	Latitude, 9·35· 3	N.

November 15, 1841.

	⊙	
Obsd. Merid. Alt. Sun's Lower Limb,	123·18·40	
	2· 5	I. E.
	2)123·16·35	
	61·38·17	
	·27	Refrn. and Par.
Ankober, ...	61·37·50	
* Merid. Alt. 9·35·23	16·12	½ Diameter.
⊙ Merid. Alt. 9·35· 3		
⊙ „ „ 9·35·24	61·54· 2	
50	28· 5·58	
	18·30·34	Corrected Decln.
Kirk's, . . 9·35·17		
Barker's, . 9·34·45	Latitude, 9·35·24	N.
70· 2		
Mean Latitude, 9·35· 1		

No. III.—*Barometrical and Thermometrical Observations for determining the Elevation of Stations on the Route between Tajoora and Ankober, by Assistant-Surgeon R. Kirk.*

From frequent trials, made on the beach at Tajoora, the Thermometer was found to boil at 212 deg. 8 min., the height of the Barometer at the same time by the mean of three instruments being 29·976 inches, indicating an error of 8·10 to subtract.

Warilissan, June 5, 1841.

Height of Barometer,		28·309
Neutral point,	30·012	28·309
	28·308	28·306
	55)1·704	28·308 Mean.
	·031	·031
		28·277
		·043 Capillary attracn.
		28·320

	Upper Station.	Lower.		
Detached Therm.	102	80		
Attached do.	102	80	102 + 80 =	182
Barometer,	28·320	30·000	102 — 80 =	22

A = 4·83416
B —0·00096
C = 0·00107 —1·47712 Logm. Lower Barometer.

1·47808
1·45209 Logm. Upper Barometer.

R = 8·41481 Log. 0·02599
Logm. 3·25004 = 1778 feet elevation.

Warilissan, June 5, 1841.
Boiling point by Therm., . 210·
·8 Error.

209·2 Therm. 94 deg.

209· deg. = 1534
·2 = 102

1432 × 1·129 = 1616·7 ft.

Height by Barometer, . 1778
„ Thermometer, 1617

2) 2395

1697 Mean elevation of Warilissan.

Mooya, near the shores of the Salt Lake, June 6, 1841.
Barometrical Observations, by Lieut. Christopher, I. N., in Goobut Khrab.

8 A.M. June 3, . .	29·714	Therm. 91·5
„ do. 4, . .	29·775	„ 92·
„ do. 5, . .	29·722	„ 92·
	3) 89·211	
Means, . .	29·737	92·

Mooya, on the margin of the Lake, by Lieutenant Christopher.
8 A.M., June 6, . . 30·306 . . 94 deg.
94 + 92 = 186 94 — 92 = 2
A = 4·83596
B = —0·00009
C = 0·00106 1·47330 Logm. Barometer Goobut Khrab.

1·47339
1·48153 Logm. Barometer Salt Lake.

R — 7·91062 Log. —0·00814

Log. — 2·74764 = 559 feet *below* the level of the Sea.

Mooya, June 6, 1841.
Boiling point, of Therm., . . . 213·9
Therm. 98 deg., ·8 Error.

213· = 507 213·1
·1 = 50·5

557·5 × 1·137 = 633·9
76·4 557·5

76·4

Below level of Sea, . 481 Mooya
100 Height of Mooya above level of Salt Lake.
Feet . 581 Salt Lake below level of Sea.

By Barometer, . . 559
„ Therm., ... 581

2)1140

Mean feet . 570 Salt Lake below level of Sea.

From this date, from exposure to the intense heat, the Barometers became leaky and useless.

Ulooli, June 10, 1841.

Boiling point of Therm., . . . 212·4 Therm. 90 deg.
·8 Error.

211·6

211· = 509
·6 = 306

203 × 1·121 = 228 feet above level of the Sea.

Gobat Valley, June 15, 1841.

Boiling point of Therm., . . . 211· Therm. 105 deg.
·8 Error.

210·2

210· = 1021
·2 = 102

919 × 1·15 = 1057 feet above level of the Sea.

Doolool Plain, at Dahwailaka, June 19, 1841.

Boiling point of Therm., . . . 210·7 Therm. 100 deg.
·8 Error.

209·9

209· = 1534
·9 = 459

1075 × 1·142 = 1228 feet above level of the Sea.

Koorandudah, near Fiuloo, June 23, 1841.

Boiling point of Therm., . . 210· Therm. 90 deg.
·8 Error.

209·2

209· = 1534
·2 = 102

1432 × 1·121 = 1605 feet above level of the Sea.

Kilulloo, June 1841.

Boiling point of Therm., . . 210·0 Therm. 96 deg.
·8 Error.

209·2

209· = 1534
·2 = 102

1432 × 1·133 = 1622 Elevation of Camp at Kilulloo.
80 Above the level of the Ravine.

Feet 1542 Ravine above level of the Sea.

Warimillee, July 1, 1841.

Boiling point of Therm., . . 209·8 Therm. 100 deg.
·8 Error.

209·0

209· = 1534 × 1·142 = 1752 feet above level of the Sea.

Banks of the Hawash River, near Melkakooia, July 11, 1841.

Boiling point of Therm., . . 209·0 Therm. 100 deg.
·8 Error.

208·2

208· = 2049
·2 = 102

1947 × 1·142 = 2223 feet above level of the Sea.

Dathara, in the Waddy Kokai, July 14, 1841.

Boiling point of Therm., . . 207·7 Therm. 92 deg.
·8 Error.

206·9

206· = 3085
·9 = 468

2617 × 1·125 = 2944 feet above level of the Sea.

Alioamba, July 1841.

Boiling point of Therm., . . 203·4 Therm. 72 deg.
·8 Error.

202·6

202· = 5185
·6 = 318

4867 × 1·083 = 5271 feet above level of the Sea.

Ankober, August 1841.
Boiling point of Therm., . . 197·9 Therm. 62 deg.
·8 Error.

197·1

197· = 7864
·1 = 54

7810 × 1·062 = 8294 feet above level of the Sea.

Ankober, September 1, 1841.
Boiling point of Therm., . . 198·1 Therm. 61 deg.
·8 Error.

197·3

197· = 7864
·3 = 162

7702 × 1·060 = 8164 feet above level of the Sea.

Ankober, September 7, 1841.
Boiling point of Therm., . . 198·0 Therm. 57 deg.
·8 Error.

197·2

197· = 7864
·2 = 108

7756 × 1·052 = 8159 feet above level of the Sea.

Ankober, October 5, 1841.
Boiling point of Therm., . . 198·0 Therm. 58 deg.
·8 Error.

197·2

197· = 7864
·2 = 108

7756 × 1·054 = 8175 feet above level of the Sea.

By Observation in August, . 8294
„ September 1, 8164
„ do. 7, 8159
„ October 5, . 8175

4)32792

Mean Ankober, 8198 feet above level of the Sea.

No. IV.—*Distribution of the Tribes between Tajoora and Shoa, from information given by Mohammed Ali.*

The tribe and authority of the Sooltan of Tajoora extends from Mursa Dooan to the Salt Lake. From the Salt Lake to Ramudalli is the territory of Loheita Ibu Ibrahim, Agil of the Roheitas, who are also called Debenik. From Ramudalli to Suggagedan is the territory of Ibrahim Ibu Hameido, Agil of the Ey Soumali, (Wuheema.) From Suggagedan to Warimillee is the territory of Wyess Ibu Hugaio, Agil of the Wuheema. From Warimillee to Murow belongs to the tribe of Debenik, who have two chiefs, Bedar and Abukeri Ibu Soombool. From Murow to How is the territory of Sheik Omar Butto, of the tribe of Tughael. From How to Ferri is a mixed population from all the tribes, but principally the Adalli, under the authority of the Woolusma Mohammed Abogas, under the king of Shoa. These tribes, in time of war, or when called out to repel the attacks of either the Eesa, Mudaitos or Gallas, their neighbours to the S.E. and N.W., assemble together under the title of Debenik Wuhuma. The road lies through these tribes from Tajoora to Abyssinia, bounded on the north-west by the Mudaitos, on the south-east by Eesa as far as Kilulloo, and from thence by the sub-tribes of the Galla. The Eesa appear to be the most powerful of all the tribes, their country extending from Goobut Khrab to thirty miles south of Zeyla, and from thence to the very limits of the Galla territory.

No. V.—*Observations to determine the longitude of Ankober, by Assistant Surgeon,* R. KIRK.

To Captain W. C. HARRIS, in charge of a Mission to the Court of Shoa.

SIR,—Deeming it an object of considerable Geographical interest to determine the true position of Ankober, as a point of departure from which routes in this part of Africa may be protracted, I have the honour to forward the Report of a series of Lunar Observations taken during the two last months.

Lieutenant Barker, I.N., places Ankober in latitude 9 deg. 34 min. 44 sec. N., and my observations make its longitude 39 deg. 54 min. E. This result was obtained as follows:—the total number of lunar distances observed was twenty-eight, giving a mean longitude of 39 deg. 51 min., but as several of these differed very considerably from this approximation, I have thought it better to select the five best observations on each side the sun, by which the following series was obtained, giving a mean longitude of 39 deg. 53 min. 48 sec. E. of Greenwich.

Mean Time.				Apparent distance of Sun from Moon.	Apparent altitude of Sun's centre.	Apparent altitude of Moon's centre.	Longitude. Sun. to W. of Moon.	Sun. to E. of Moon.
Dys.	Hrs.	Min.	Sec.	Deg. Min. Sec.	Deg. Min. Sec.	Deg. Min. Sec.	Deg. Min. Sec.	Deg. Min. Sec.
1841, Dec...21	3	4	0	95 1 36	33 36 5	43 46 10	39 34 30	0 0 0
... ... 22	2	57	49	106 32 20	35 13 18	32 21 47	39 39 0	0 0 0
1842, Jan... 3	20	52	7	86 14 42	32 45 43	42 27 16	0 0 0	40 1 45
... ... 3	20	53	28	86 14 22	33 2 0	42 11 44	0 0 0	40 5 30
... ... 4	20	51	42	73 48 32	32 38 41	49 29 7	0 0 0	40 11 30
... ... 4	20	53	25	73 47 57	32 59 29	49 9 39	0 0 0	40 9 30
... ... 17	2	54	5	63 29 54	39 38 27	70 44 14	39 34 0	0 0 0
... ... 18	3	21	59	74 54 33	34 11 15	68 19 53	39 41 45	0 0 0
... ... 22	3	21	7	123 11 55	35 1 3	21 13 24	39 47 45	0 0 0
... ... 31	20	38	2	105 13 56	30 21 10	27 17 54	0 0 0	40 12 45
						5)	197 0	41 0
							39 39 24	40 8 12
							40 8 12	
						2)	79 47 36	
						Mean Longitude of Ankober,.....	39 53 48	East.

These distances were taken with a sextant by Jones, of nine-inch radius, and divided to ten seconds. Having no assistants to take the corresponding altitudes, they were obtained by proportion, from altitudes observed before and after the distance; or when the height of the object prevented the use of the artificial horizon, by calculation for the required time.

This longitude agrees very well with the protracted route from Tajoora to Ankober, which gives 178 English miles of westing from the Salt Lake (the last station fixed by astronomical observation;) this distance, allowing a degree of the meridian in the middle latitude 10° 30′ to be equal to 68·3 statute miles, gives the difference of longitude = 2° 36′.

Longitude of Mooya, on Salt Lake,	42	33 E.
178 statute miles, . . .	2	36
Longitude of Ankober, . .	39°	57′ E.
By lunar distances, . .	39	54 E.
		3′ difference.

Further corroborating the accuracy of this result, I also give the longitude obtained by altitudes of the moon, which it will be seen individually give as close an approximation as the lunar distances.

Mean-Time.	Days.	Hours.	Minutes.	Seconds. Tenths.	Double altitude of Moon's upper limb by artificial horizon corrected for index error.	Longitude.
1842, January,.....	4	20	52	2 7	☽ 99° 21′ 48″	40° 10′ 30″
,, ,,	21	3	38	55 0	... 76 1 0	39 44 27
,, ,,	23	5	34	30 9	... 74 2 8	39 43 25
,, ,,	24	6	16	23 4	... 64 53 20	39 45 25
,, ,,	30	19	3	39 3	... 79 6 5	39 59 55
					5)	199 23 42
Longitude of Ankober by Lunar Altitudes,.....						39 52 44
Do. Do. Distances,.....						39 53 48
Difference,.....						1 4

As I believe this problem is not generally known, I subjoin the Rule and an example.

Given, the Latitude, Estimated Longitude, Mean-Time of Observation, and Moon's Observed Altitude, to find the Longitude.

RULE.—With the estimated longitude, turn the mean-time of the place of observation to the corresponding mean-time at Greenwich, and to this reduce the Equation of Time, Sun's Right Ascension, Moon's Declination, Semi-diameter, and Horizontal Parallax. Find the Moon's horary angle or distance from the Meridian, and then, if east, add—if west, subtract it from the right ascension of the Meridian; the resulting quantity, rejecting twenty-four hours if necessary, is the right ascension of the moon's centre for the time and meridian of observation. Find by proportion the corresponding mean-time at Greenwich, at which the moon will have the same right ascension, when the difference of time will be the Longitude of the place of observation.

EXAMPLE.—January 30th, 1842, 19h. 3m. $39\frac{3}{10}$s. mean-time at Ankober; observed double altitude of moon's upper limb, 79° 4′ 55″; estimated longitude, 39° 54′ E.; latitude, 9° 34′ 44″ N.; index error, 1′ 10″ add.

Mean-time, . . .	19h.	3m.	39·3s.
Longitude in time, . . .	2	39	36·0
Greenwich Mean-time,	16	24	3·3
	24		
From Greenwich Mean noon of 31st,	7	35	57

Equation of Time, 31st, Noon,	13′ 47″·01
Correction for 7·35·57, . .	2 ·90
Corrected Equation time, .	13′ 44″·11

Sun's right Ascension, 31st, Noon,	20°	54′	57″·88
Correction, 7·35·57, . .		1	17 ·83
☉'s Corrected right Ascension, .	20	53	40 ·05

Moon's semi-diameter, corrected,	16′	6″
Augmentation, . .		10
☽'s Augmented ½ diameter,	16	16

☽'s Corrected Horizontal Parallax, . 59′ 4″

Moon's declination, 30d. 16h.	9°	30′	10″ ·0
Correction for 24m. 3s., .			5 55
☽'s Corrected declination, .	9	39	5 S.

☽

79° 4′ 55″
1 10 I.E.

2)79 6 5

39 33 3
1 9 Refraction.

39 31 54 — 11280 secant of Altitude.
Par. in Alt. 45 33 48393 P. Log. of Hor. Par.

40 17 27 59673 P. Log. of Par. in Altitude.
16 16 Augmented half diameter.

40 1 11 True Altitude ☽'s centre.

☽'s Declination s. 9° 36′ 5″ — Secant, 10·006127.

Latitude N.,	9	34	44	Secant., 10·006098
Nl. C. S.,	19	10	49	= 944490
N. Sine,	40	1	11	= 643051

Logarithm of 301439 = 4·479199

Horary Angle, 3h. 5m. 29s·6 = 4·491424.

Mean-Time of Observation,			19h. 3m.	39s·30
Equation of Time,			13	44 ·11
Apparent Time,			18 49	55 ·19
☉'s Right Ascension,			20 53	40 ·05
			39 43	35 ·24
			24	
Right Ascen. of Meridian,			15 43	35 ·24

Right Ascension of Meridian,		15h. 43m.	35s.	·24
Horary Angle, ☽ west of ☉,		3 5	29	·60
☽'s Right Ascen. at time of Observ.,	12	38	5	·64
☽'s do. Greenwich, Jan. 30, 16h.	12	37	14	·48
			51	·16 remainder.

As 2′ 9″·74 change bet. 16th and 17th hours =	129″·74 log.	2·113074
: 1 hour, =	3600 „	= 3·556303
:: 51″ 16 =		1·708931
		5·295234
: 60)1419″·6	log.	= 3·152160
Proportional period for 51″·16,	23′ 39″·6	

Mean-time of observation,		19h.	3m.	39s. ·3
Mean Greenwich Time, corresponding to ☽'s R.A. time of observation,	16	23	39	·6
Difference, being Longitude in Time,	2	39	59	·7
= Longitude,	39	59	55	E.

This problem is very simple, appears perfectly correct in principle, being merely the converse operation to finding the apparent time, and requires but one observer; but to obtain a satisfactory result, the greatest nicety is required in the calculation, more especially in reducing the sun and moon's elements to the corresponding Greenwich time. Great accuracy is also required in the time, an error of one second of time, and consequently in the moon's right ascension, producing an error of about six miles in longitude. I have found the morning and evening twilight, whilst there is yet light sufficient to read off the altitudes, the most favourable time for these observations.—I have the honour to be, &c., &c.,

R. KIRK,
Assistant Surgeon.

ANKOBER, *Feb.* 27, 1842.

A glass for observing the eclipses of Jupiter's satellites was subsequently received from Bombay; but from its inferior quality, and the great indistinctness of the margin of the planet as seen through it, no satisfactory observations could be taken.

No. VI.—*Report on the Magnetic Variation at Ankober.*

To His Excellency Captain W. C. HARRIS,
Ambassador at the Court of Shoa.

SIR,—I have the honour to forward a Report of the following Observations taken to determine the Magnetic Variation at Ankober, by the passage of the Polar Star over the Meridian.

Date.	Mean Time of Meridional Passage of α Polaris.			Bearing by Compass.
	Hour.	Min.	Sec.	
1841—November 27,	8	37	13	N. 7° E.
,, ,, 28,	8	33	17	N. 6° 45′ E.
,, ,, 29,	8	29	21	N. 7° E.
,, December 12,	7	38	6	N. 7° E.

Determining the Magnetic Variation at Ankober to be 7° westerly.

The time of the meridian passage was noted by a well-regulated chronometer, and the bearings taken with a prismatic compass by Gilbert.—I have the honour to be, sir, your most obedient servant,

R. KIRK, Assistant-Surgeon,
Attached to the Embassy.

ANKOBER, *Dec.* 20, 1842.

Account of Djebil Teer, by Assistant-Surgeon R. KIRK.

DJEBIL TEER, the mountain of birds (from the number of sea-fowl which resort to it), is also called Djebil Dookhan, or the smoking

mountain. It is a circular island of about 2½ miles in diameter, and 900 feet in height, situated in lat. 15° 32′ N., and long. 41° 57′ E.

Its appearance, on approaching, is that of a hill of considerable elevation, rising from a plain, terminating at the eastern extremity in a steep bluff, and surmounted by two conical peaks, from the foot of which we saw at daybreak a considerable volume of smoke, which continued issuing from the mountain for about two hours. The aspect from the sea is barren and dreary in the extreme, the cinder with which it is covered giving it an unnatural bluish-black appearance. There are no soundings at 150 fathoms close to the island, so that the ship was obliged to stand off and on whilst we remained ashore.

On landing on the western side, we first met with a gentle ascending plain, entirely covered to the water's edge with large irregular masses of cinder; after crossing this for about half a mile, we came to a steep hill of about 300 feet elevation, the surface composed of light brown ash, and small loose cinder, with a few stunted bushes occasionally. On ascending this, we found ourselves on the edge of a second sloping plain, about a mile across, from the centre of which arose two conical peaks. This second plain, like the former, was entirely covered with masses of black cinder, but intersected with hardened streams of lava. On proceeding to the peaks, we found at their foot about fifteen small craters, from four to ten feet across: from orifices at the bottom of several of these, steam and hot air were issuing, but we were unable to decide from which the smoke we saw in the morning had ascended; the edges were slightly raised and coated with lava, hanging in the form of stalactites. From these craters streams of red and black lava were seen issuing and meandering along the plain; we also found these streams issuing from several deep extensive fissures on the plain. The lava appears to have flowed principally towards the eastern side of the island, from whence it descended into the sea. On ascending the eastern peak, which is about three hundred feet high, and partly covered with short stunted grass, we found near the summit extensive patches of sulphur, massive, and in crystals, from which fumes were issuing; also incrustations of a white substance, of the composition of which I am ignorant: the earth was at this part so hot that we were unable to bear our hands on it. The summit of the peak was terminated by the remains of two craters, the largest about twenty-five feet in diameter, which have fallen in. On descending the peak, we discovered about half way down an oblong cave, about forty-five feet in diameter and thirty high, the sides entirely composed of lava; it had no aperture except the small one by which we entered. We found the northern peak to terminate in the remains of a single crater; it was apparently of more recent formation than the other, the sides were more precipitous, and entirely covered with small loose cinders, without any appearance of vegetation. I was unable to obtain any specimens of the original structure of the island, but at the bottom of a deep narrow ravine extending through part of the upper plain, I saw some rock having the appearance of sandstone.

Our principal pilot, Mohammed, says that he remembers seeing the island burning about twelve or fifteen years ago. The Arabs have a superstitious dread of the place: they were formerly in the habit of visiting it for the purpose of procuring sulphur, but a few years since two men belonging to one of their boats having slipped down one of the craters, were so bruised as to occasion death. I believe they have since then discontinued landing on it.

The group of the Laboojur Islands, which we saw to the eastward from the summit of Djebil Teer, appear from their form to be of volcanic origin, but we have not yet had an opportunity of examining them.

Note on Lacusterine Tertiary Fossils from the Vindiah Mountains near Mandoo; and on the Period of the Elevation of that Chain.—By J. G. MALCOMSON.

To the Secretary of the Geographical Society, Bombay.

DEAR SIR,—I have the pleasure to enclose a note on the Fresh Water Fossils from the Vindiah Hills, found amongst Mr Blake's Mandoo Specimens, and which you consider would be a proper subject for the Geographical Society's proceedings. The speculations that follow, whatever their worth may be, are not without some interest, and may direct attention to the true method of investigating the physical geography of a mountainous country. On this subject there is no appeal from the precept and example of the greatest of living geographers—Humboldt. —I remain, dear sir, yours faithfully,

JOHN G. MALCOMSON.

Bombay, February 10, 1844.

Amongst the extensive collection of Geological Specimens from the Vindiah Mountains, presented to the Bombay Branch Royal Asiatic Society by the late Lieutenant Blake of the 7th Regiment, N.I., there are some masses of an indurated clay from Gharri, a village near the foot of the Nalcha Ghaut, which leads from Mandoo to the table-land of Malwa. The character of this rock differs in no respect from that of the singular fresh water formation of the Hyderabad and Nagpore territories, which I have described at length in the Journal of the Asiatic Society of Bengal,* and in the transactions of the Geological Society of London.†

The Gharri specimens, perhaps, show fewer marks than those of Nagpore, of the fresh water beds from which they have been taken, having been altered by the intrusion of the trap rocks which now cover

* Journal of the Asiatic Society of Bengal, February 1836.

† Transactions of the Geological Society, vol. v., p. 537.

such vast tracks of this part of India. They, however, afford indications sufficiently distinct of their having been subjected to intense heat. Mr Blake's lamented death has prevented his giving any account of the locality; and it is proper to state that a few only of the specimens had labels attached to them, but it was evident that most, if not all, were collected about the same place.

The rock consists of a very tough indurated clay, of a yellowish white or gray colour, for the most part laminated; and the specimens appear to have been taken from strata of from four to ten inches in thickness. Many of them, towards the middle, resemble a green flinty slate, the outer layers being softer, of a white colour, and more earthy, as if from weathering; and in some of the specimens this is seen in the cross fracture to form the centre of the mass, but approaching the surface in an irregular manner in dark coloured polygons, surrounded by the white indurated clay, in some places not a line in thickness, in others two or three inches, showing that the appearance depends in part on a concretionary structure. The rock effervesces feebly with acids, probably from the fragments of shells everywhere diffused through it. Some of the specimens are of a blackish colour, of great specific gravity, break with a conchordal fracture, and are partly composed of a hard chert, and of a red jasper which weathers into a yellowish ochre.

The fossils are for the most part casts of the interior of the shells, which are frequently lined with quartz crystals, but not possessing the beauty of the Nagpore specimens. In a few the interior is entirely filled with calcedony; and in one example, in which the rock is converted into a hard black chert, with calcedonic veins and spots scattered through it, the shells (for the most part palludina) are filled with the same calcedony, while the shell itself remains unaltered, and effervesces strongly as it dissolves in acid. In some of the calcedonii casts the black matter of the rock occurs, as if it had been partially changed into calcedony by heat. This specimen had no label. It is very similar to some of the Saugor specimens presented by Dr Spilsbury to the Asiatic Society's museum. The same specimen contains casts of the outer surface of melania. The larger shells in all the specimens appear to have been compressed, and are often only partially fractured, as in the same shells, chiefly Physa prinsepii from the Gawilghur hills, so well described by Dr Voysey.* I do not, however, agree with Dr Voysey, in considering this appearance as itself a sufficient proof that the shells had been softened by the heat of the eruptive rocks, by which the fosiliferous strata had been elevated and altered.

The fossils I have identified are the following:—*Physa prinsepii*, *Paludina Deccanensis*, and *Limnea subulata*—of which there is only one or two imperfect specimens; *Melania quadri-lineata*—mostly casts of the exterior of the shell; internal casts of *Cypris subglobosa*, and of *Cypris cylindrica*; numerous examples of the first of these minute crustaceans occur, but the second is rare.

* Asiatic Researches, vol. xviii.

One or two impressions resemble those of Chara, but they are very indistinct; and there are fragments of plants such as occur in the Sichel Hills, between Hyderabad and Nagpore. The unios which abound in that range do not occur in the specimens.*

These facts establish the important inference, that the part of the Vindiah range near Mandoo was elevated during the same comparatively recent epoch as the Sichel Hills between the Godavery and Taptee, the Gawilghur range, and the Satpoora mountains south of the Nerbudda. This conclusion I had already arrived at, with respect to the eastern part of the chain, from a careful study of specimens, and of the observations of Drs Spilsbury and Spry, near Jubbulpore and Saugor, not far from which the Vindiah and Satpoora range may be considered to have united. But the importance of the Vindiah mountains in the physical geography and geology of India gives great interest to the conclusion, that the convulsions which had effected with such violence the eastern part of the range, had extended this far to the west, at a period in the geological history of the earth so recent as that to which I have referred the elevation of so many of the parallel chains in Middle India. Nor will it be without interest to those who have not attended to the recent progress of these sciences to find, that "these wrecks of a former state of nature thus wonderfully preseved (like ancient medals and inscriptions in the ruins of an empire) afford a sort of rude chronology"† of these mountains, so sacred in the eyes of the Hindoos, previous to the first dawn of their earliest traditions.

But it is in reference to Elie de Beaumont's grand generalisation—that *parallel mountain chains were elevated at the same epoch in the Earth's history, in consequence of the contraction of its crust by secular refrigeration of its heated interior*—that these specimens acquire their chief interest. Few generalisations of the present age have more numerous or important applications than this, and none so fully bears out Herschel's remark, that geology, in the magnitude and sublimity of the objects of which it treats, ranks in the scale of the sciences next to astronomy.‡ But I do not presume to enter on the question still

* In these specimens Melanias are mixed with Paludinas and Limneas, more commonly than in the Neermuil rocks, where the singular association of species noticed by Des Hayes in the following passage, was in a great measure maintained:—

"Il est remarquable que dans les eaux douces où sont les Mélanies on ne rencontre le plus ordinairement ni Paludines, ni Limnées, ni Planorbes, mais en abondance des Mélanopsides et des Néritines: à la place des Mulettes on rencontre des Cyrènes. Ces associations d'espèces, qui ont lieu dans l'état de vie, se retrouvent encore lorsque les races ont été enfouies et sont devenues fossiles; on ignore totalement les causes que les produisent. Pour quoi dans certaines eaux ne voit on que Paludines, Limnées, Mulettes, et dans celles d'un pays limitrophe ne rencontre-t-on que Mélanies, Mélanopsides, Néritines et Cyrènes? Il est bien difficile de résoudre ce problème."

Description de Coquilles caractéristiques des Terrains, from M. G. P. Des Hayes, page 155.

† Herschel on the Study of Natural Philosophy, p. 285. ‡ *Op. cit.*, p. 287.

agitated between the adherents of this and the rival theory of Lyell. Leaning, however, to the former opinion, I still agree with M. Boue that these speculations, when they refer to mountains as yet untouched by the hammer, are not entitled to much confidence, and I therefore do not allow on such evidence that the Pyrenees, Apennines, and Ghauts are of the same age, or that the principal chain of the Alps, Mount Atlas, the Caucasus, and the Himalayas, are contemporaneous. It is our part, in this country, to examine and describe, and by the accumulation of new observations in countries so little known, to lay a permanent foundation for the elucidation of the physical and geological history of the Indian empire. The few sentences bestowed by Elie de Beaumont on the Indian mountains, in his "Recherches sur quelques-unes des Révolutions de la Surface du Globe," he himself assured me, were not intended for more than hints thrown out to stimulate and direct future observers, and he seemed to regret that he should be quoted as an authority on the age of the Ghauts, or the Vindiah mountains, regarding which he was possessed of so little information.*

There is another view in which the discovery of the lacusterine fossils of the Hyderabad, Nagpore, and Bundlecund territories so far to the north-westward, is important.

In my memoir on these fossils (Geol. Trans. vol v. pp. 553 and 565), I have referred to the proof that they afforded, of the aspect of the country having been entirely changed since the time when these shell-fish lived; as no natural lakes now exist in these countries, nor could shells have accumulated in such vast quantities in rivers such as those that at present intersect the country. Mandoo is 400 miles northwest of Neermull on the Godavery, near to which I first noticed the fossils, and nearly 300 miles west of Jubbulpoor, where they have been collected by Voysey and Dr Spilsbury, and they have been observed in the Deccan as far south as the basin of the Kistnah. Over all these tracts, then, I am justified in believing that, at one time, extensive lakes and marshy plains extended, full of the ordinary forms of

* As the original work of Elie de Beaumont is in few hands, I extract at the end of this paper all that he has said regarding Indian chains of mountains, and which the illustrious author has entitled in the table of contents, "*Conjectures* sur les Gates," &c.

Since this was written, I have read Humboldt's great work—"Asie Centrale, Recherches sur les Chaines de Montagnes, &c.," in which I was disappointed to find so little regarding India, and that not marked by the all-searching and clear-judging knowledge which distinguishes the rest of his works, and the greater part of this. How much is it to be regretted that he did not effect his fondly-cherished intention of exploring the Himalayas! The whole work appears to be based upon Elie de Beaumont's grand generalisation. The important fact that the precious metals, and many of the most rare or useful minerals, are found in certain lines of elevation, is illustrated by a vast collection of facts; and taken in connexion with the association of the Western Ghauts, the Ural and Boler mountains, in one system of elevation, extending from Cape Comorin or Point de Galle to the Frozen Sea, is so full of interest, that it may well stimulate those who have opportunities to work out the details.

lacusterine life. The precipitous, thirsty mountain ranges which intersect India, and which now rise bare and burned up in inaccessible cliffs, which for months of every year hardly afford water for the birds of the air, must then have exhibited vast plains full of fresh water lakes and marshes, on the muddy shores of which multitudes of gavials, crocodiles, and tortoises must have preyed, and amidst the rank luxuriance of the bordering vegetation the mastodons, hippopotami, bisons, and sirathena must have ranged, whose bones are now found so abundantly scattered over India. So mighty a change in the features of our adopted country may justify a little speculation: and I venture to suggest, that the changes induced by the stupendous igneous eruptions, which have formed so many picturesque mountain ranges, must not only have modified the drainage, but must at the same time have so altered the distribution of the meteoric agents, as to have cut off the clouds in their course from the Western Sea, and precipitated in those torrents which deluge the Ghauts, that water which was before poured out on the now dry countries of the Deccan, and the southern parts of Hindustan. I have elsewhere stated, that the trap rocks of Nagpore and Bundlecund have been considered by every observer to form part of the great basaltic formation of Western India, with which it is continuous, and with which it agrees in every particular of character and connexion. In the present state of our knowledge it is, therefore, safe to consider them as belonging to one period, and *subsequent to the existence of these lacusterine tertiary fossils;* nor are these inferences affected by the certainty that the Ghauts and mountains of the Deccan were not erupted at a single jet, but that at least two eruptions took place in that region.*

It would be out of place to introduce here an analysis of the meteorological observations made with so much care in this part of India, and which prove the most extraordinary influence of the Ghauts on the distribution of rain. The lofty mural precipices act in truth the part of a wall, against which the clouds strike and their water is precipitated and nearly expended. They may be compared to a wall, which I have seen erected to stay the flood of sand-drift, but which itself soon became buried in the incessant shower. Here the resemblance ends, for the sand remains and forms a new starting place for

* The existence of basaltic dikes through the amygdaloid has been long known; but more decisive proof is derived from the occurrence of a great bed of basaltic breccia, containing fragments of a compact basalt, and a very porous amygdaloid like scoriæ, under the basalt capping the Khandalla Ghaut; and also near the summit of Singhur Hill fortress, which is a lofty summit rising above the long spur which extends from the Ghauts across the Deccan between Poonah and Sattarah. Of the same fact abundant proof is afforded, by the distribution of trap pebbles through the tertiary sandstones of Perin Island and Kattiawar, and in the cornelian conglomerates of Broach and Rajpeepla, which last have been remarkably altered by the intrusion of more recent igneous rocks, which I propose to describe in detail at some future period. In the former instances the eruptions may have followed each other almost immediately, but in the last examples a long period must have elapsed.

the destructive agent, while the water finds its way loaded with the soil and disintegrated rock into the ocean.

In 1835 the fall of rain at Bombay was 71·39 inches, or five inches less than the average of twenty-five years. At Khandalla, at the top of the Bhore Ghaut, 1740 feet above the sea, and thirty miles inland, 114·43 inches fell; while at Poona, forty miles farther eastward, the average fall is only 23·43 inches. In 1835 the difference was still more remarkable—viz., at Bombay 62·61 inches, and at Khandalla 168·75. But it is where the Ghauts rise to a greater height, that the influence of the elevation of this chain on the distribution of moisture in the interior of India will be most strikingly exhibited. Dr Murray states, in his observations on the climate of the Sanatarium at Mahabuleshwur, which is twenty-five miles due east from the sea, and 4500 feet above its level, that the mean annual quantity of rain is 239·80 inches. The greatest annual fall (which occurred in 1834) amounted to 297·41 inches, a result unprecedented in meteorology.* But the most extraordinary fact bearing on this point is that exhibited in the following table by Dr Murray, showing the amount of rain at the Sanatarium at Mahabuleshwur; at Pamhgurry, a village only ten miles distant, on the eastern slope of the hills; at Bombay and at Poona, for 1842.

Amount of rain during June, July, August, and September, 1842.†

AMOUNT OF RAIN.

1842, Monsoon.	Sanitarium Mahabuleshwur, In. 289·37.	Pamhgurry. In. 48·67.	Poona. [14·77½.	Bombay. 87·33.

This table leaves no room to doubt that the elevation of these mountains would be sufficient to produce the effects which I have ascribed to that event in the earth's history.

* Bombay Medical and Physical Transactions, vol. i., p. 107, Dr Murray quotes an observation of a M. Lago, recorded by Humboldt, who thinks that 280 *may* have fallen in 1821 *only*, at San Luis de Maranho in Brazil, where the land is in much the same state as I suppose the Deccan to have been before the elevation of the Ghauts.

† Bombay Medical and Physical Transactions, vol. v., p. 176. I have not referred to Colonel Sykes' paper on the extraordinary fall of rain at the Mahabuleshwur Hills, as his information is derived from a copy of Dr Murray's observations, and differs from Dr Murray's report 4·40 inches in excess; and because Colonel Sykes' paper was not read till 1839, or published till 1840 in the reports of the British Association for 1839; while Dr Murray's excellent report above quoted was presented in 1836, and published in 1838. It is a practice too common to quote from the European retailers of the labours of observers in India, instead of from the original observations, which is as injurious to science as it is unjust to individuals. I believe that Colonel Sykes had no intention of claiming the merit of these very interesting and well-conducted observations of Dr Murray's.

NOTE 1.—*Extracts from "Recherches sur quelques-unes des Révolutions de la Surface du Globe."* Par M. L. ELIE DE BEAUMONT.

"*Conjectures sur les Gates.*

"Vouloir suivre ce système jusque dans l'Inde paraîtrait peut-être abuser de la faculté des rapprochemens : cependant je crois devoir faire remarquer que la chaîne des Gates, sur la côte de Malabar, semble se cordonner encore à la direction dont je m'occupe. La grande faille à laquelle paraît dû l'escarpement occidental des Gates, en élevant les plateaux du pays des Marhattes, du Decan, et du Carnatic, a élevé en même temps le grand dépôt argilo-ferrugineux de latérite qui forme les points les plus élevés de ces plateaux, ainsi que le montre la coupe des Gates donnée par M. Christie. Il est à regretter que ce dépôt de latérite, qui couvre dans l'Inde de si vastes êtendues, n'ait jusqu'à présent offert aucun fossile, et ne puisse être rapporté avec certitude à aucun étage géologique déterminé ; mais on peut toujours remarquer que tant qu'on n'aura pas indiqué d'autre chaîne qui produise sur la latérite l'effet mentionné ci-dessus, tout conduira à voir dans les Gates la chaîne la plus récente de la presqu'île occidentale de l'Inde, dont elle est en même temps le trait géométrique le plus prononcé."—*Page* 319.

. . . . . .

"Telle est encore la disposition générale de la presqu'île occidentale de l'Inde, relativement à l'océan Indien d'une part, et à l'Hymâlaya de l'autre. Les roches primitives et de transition, qui occupent de vastes étendues dans la partie méridionale de cette presqu'île, et dans l'île de Ceylan, s'y trouvent baignées, vers le sud et le sud-ouest, par les eaux de l'océan, au lieu d'y être bordées, ainsi qu'on aurait pu s'y attendre, par une ceinture des mêmes dépôts récens qui forment en partie les plaines du Gange, de Brahm-Putra, de l'Irawaddy, et une partie des rivages du Golfe du Bengale.

"Ces rapports généraux de disposition tendent également à faire regarder les Alps de la Savoie comme plus récentes que les collines primitives de la Bretagne, l'Hymâlaya comme plus récent que les Gates, et les Andes comme plus récentes que les Alleghanys."—*Page* 322.

"*Conjectures à l'Hymâlaya.*

"Les diverses chaînes parallèles entre celles de l'Asie Mineure et celles du Paropamissus de l'Indou-Kosh et de l'Hymâlaya, forment, d'après les cartes les plus récentes, une série de grandes chaînons tous à peu prés parallèles à la direction de l'Atlas, supposée prolongée par une suite de jalons. Il existe un rapporte de disposition difficile à méconnaître entre lá situation de l'Hymâlaya au nord des plaines du Gange et celle de la chaîne principale des Alpes au nord des plaines du Pô. Les cours d'eau qui s'échappent de l'une ou l'autre chaîne de montagnes s'infléchissent de la même manière dans la contrée basse qui la borde pour tomber les unes dans le Gange comme les autres dans le Pô ; ce

qui semble indiquer que la première plaine doit être, comme la seconde, formée par une vaste alluvion descendue des montagnes voisines. Le système géologique de la presqu'île occidentale de l'Inde s'élevé, au midi des plaines du Bengale, à peu près comme celuides Apennins au midi des plaines de la Lombardie ; et on pourrait, par suite de cet ensemble de rapports, remarquer des analogies de situation géographique et commerciale entre Milan et Dehly, entre Venise et Calcutta, entre Ancône et Madras, entre Gênes et Bombay. Les rapports que je signale deviendraient plus frappans encore si le cours de l'Indus, étant barré par des montagnes comparables en position à celles qui vont de Gênes au Col de Tende, les eaux de ce fleuve et celles de la rivière Setlej et de ses autres affluens étaient obligées de franchir le seuil peu élevé qui les sépare de la grand vallée du Gange. Toutefois, pour compléter la similitude, il faudrait retrouver au pied sud de l'Hymâlaya des lacs comparables à ceux de la Lombardie. Mais si les lacs manquent, les traits de resemblance qu'ils dévoileraient ne manquent pas entièrement. Les lacs de la Lombardie remplissent des dépressions parallèles à la direction des Alpes occidentales, coupée sous un angle 45° à 50° par selle de la chaîne principale des Alpes ; et M. de Humboldt a depuis long-temps comparé l'angle que présentent la direction de l'Hymâlaya et celle du Belour-Tagh, qui se trouve plus au nord dans la Tartarie, à l'angle que présentent nos Alpes à la hauteur du Mont-Blanc.

" On voit donc que certaines considérations accessoires viennent déjà se joindre à l'*induction tirée de la conformité de direction* pour faire regarder l'Hymâlaya et la chaîne principale des Alpes (du Valais en Autriche) comme étant deux élémens d'un vaste système de sillons saillans qui se seraient produits dans l'écorce minérale du Globe terrestre au moment où se sont redressées les couches du terrain de transport ancien des environs de Mezel (Basses-Alpes) et avant le passage des courans qui ont laissé tant de traces de leur action dans la plupart des vallées des Alpes, et particulièrement dans celles de la Durance, de l'Isère, et du Rhône."—*Pp.* 222, 223, 224.

The widely-distributed formation referred to in the first of the above extracts, known in India under the name of Laterite, I believe to have had its origin in the decomposition (generally *in situ*) of rocks containing minerals abounding in iron—such as syenite, hornblende, schist, and basalt—and its ordinary relations will, therefore, afford no proof of the period of the elevation of the chains on the summits or declivities of which it occurs. On the highest part of the hills at Khandalla, the basalt is seen changed *in situ* into this singular rock.

Note II.—*Conjecture as to the Cause of the great Extent of Ancient Glaciers in Europe.*

If it could be shown that similar causes have been in operation to modify the distribution of rain in the Alps, as we have supposed to have produced such great effects in India, we would require to have

recourse to no such improbable suppositions as that of a period in the earth's history of excessive cold. The extension of glaciers from the main chain of the Alps across the valley of Switzerland, by which the great blocks of the granite of Mount Blanc were placed on the steep slopes of the Jura, would be otherwise accounted for. Such a cause may, perhaps, be found in the Diluvian ocean, which then covered a great part of Europe, and which left those vast beds of rolled pebbles and sand, which occur with the erratic blocks, but which were evidently produced by a different cause. This sea would have afforded a great body of watery clouds, which, hurried on by the south winds, would have been condensed into snow on the higher Alps, and have fed glaciers of far greater extent than those that now descend into the valleys of the Rhone. J. G. M.

Extract from a Journal kept during a partial Inquiry into the present Resources and State of North-Eastern Africa, with Memoranda. By Lieutenant W. CHRISTOPHER, I. N., commanding Honourable Company's Brig of War *Tigris*.

Presented by Government.

January 5, 1843.—Being ordered off expeditiously, with four months' provisions, to convey his Excellency Ali Bin Nasser, (Envoy Extraordinary from the Imaum of Muscat to her Britannic Majesty,) back to Zanzibar, I quitted Aden on two days' notice.

Had very little wind till round Gardafui on the 19th January, when the monsoon was strong and steady down the coast on to two deg. south, where it moderated, (probably from the vessel nearing the land.) Experienced very little current any way until close in shore, when the currents were violent and changeable, running against the wind frequently.

During the voyage, in addition to my ship duties, I made a point of rendering my guest's passage agreeable; as he had been accustomed to the luxuries of a first-rate hotel, at Government expense, during his stay in England of some months, I almost despaired of doing more than showing that the Government intentions were to honour him with every consideration until his arrival at the capital of the Imaum's dominions.

His Excellency Ali Bin Nasser has been twice to England in the capacity of Envoy, and visited every place of interest in London, the Zoological Gardens, &c. I asked him what kinds of animals were found in the vicinity of Mombas or on the coast, mentioning the elephant, &c.; he named the "ziraf," and described it as follows:—"That animal has two horns a cubit long, projecting as those of a bull from the head, which can be lowered or raised at pleasure. It is very irascible and strong; shields are made of its hide; sword handles, cups,

and other things, from its horns." From this account it is evident that his Excellency, although he had twice visited England, and been eight times to Bengal, had never discriminated between the accounts he had heard of the camel-leopard and the rhinoceros. What dependence can be placed on the testimony of natives, when one whom we should suppose well qualified from his enterprise and intelligence, is so defective in knowledge? One fact is, however, certain, that the name in these parts given to the rhinoceros's horn is "garu el ziraf."

Having put into Mombas for a few hours, I proceeded on to Zanzibar, and arrived on the 30th January. It happened that our arrival was on a propitious day, the weather, which had been rainy, clearing up. The Imaum's ensign at the fore, and union at the main, attracted notice, and nearly 100 guns, in the various salutes of the occasion, shook the air. The Imaum, to whom I presented the compliments of the Government, and congratulating him on the safe arrival of his envoy, with letters, &c., from the Queen, was particularly gratified, and reiterated his thanks and acknowledgments to the English, saying they were his sun and shield.

By the Imaum's invitation we visited the clove plantations. He has expended some money on two palaces, which are, however, also adapted for defence from their solidity and loop-holed upper stories; the halls are paved with marble flags, and porcelain or glassware ornament the niches, large mirrors being distributed about the rooms.

The son of a high functionary accompanied us, a young man of twenty-two, dressed in rich Arab costume, and riding a bay palfrey of the first blood. He was our conductor by the Imaum's appointment, and being an owner of clove-grounds himself, was very communicative. The plantations have a most pleasing appearance, and from their extent render the air particularly agreeable, and it is said wholesome. There are no bridges but of the roughest kind, though the Imaum has caused an aqueduct to be built extending 2000 yards into the woods, which conveys water as pure as crystal to the beach, first passing through his palace; this water is now universally praised for its qualities, excepting immediately after heavy rains.

The clove-trees are planted on the oldest soil or higher grounds of the island, at about fourteen feet apart, the intervals being kept well weeded and hard, the dead branches being cut off; the large and oldest trees reach forty feet in height, growing thick and bushy and of circular form, making highly picturesque park trees. Three days' sunning dries the bud for the market; 30,000 trees produce 1000 frazillas (of 35 lbs. each) annually, worth from 4000 to 5000 dollars at Zanzibar.

On the 11th February, after a stay of eleven days, a requisition was made by the British Consul for the vessel to proceed to Kilwa to make inquiry into the objects of a ship under French colours, said to be a slaver, that visited that port some months ago. My report on this subject has been already forwarded. I met five native boats bound to "Nosbay," the recent French settlement on Madagascar.

A specimen of a metal, which through a native I obtained at Kilwa, I have the honour to forward to Government. It is found in great quantities in the bed of a native course.

Should any attempt be made to penetrate Africa from the eastern coast, I would strongly recommend the neighbourhood of Kilwa to be avoided; its climate is most deadly to Europeans; while, on the other hand, the natives report the climate of Mombas, and northward, exceedingly healthy and recruiting in its effects.

I called on the Sultan of Kilwa, and gave him assurances of goodwill and amity. He presented me with a trifling gift of sheep, and received an equivalent return. The people of Kilwa are well disposed to the English; the forts, which were once formidable, are now complete ruins. On leaving Zanzibar there was every expectation of meeting a slaver of twenty-two guns; the crew were all in health, and our hopes were high of earning distinction and meriting applause. A few days after quitting Kilwa, a most virulent fever broke out; in three days young men and old were brought to the grave, and I had the melancholy duty of burying three Europeans from our small number in one day. I could not avoid the reflection, that the amount of suffering would have probably been less in an action with the slaver, and the loss of life perhaps not greater. Returning to Zanzibar on the 28th February, I experienced the kind and valuable aid of the British and American Consuls, who, from their local experience, were well able to tender advice. Remaining at Zanzibar till the 4th March, I hastened to procure better water at Mombas, where I anchored the following day. The fort of Mombas is the best on the coast, and has a garrison of Beloochees, twenty in number; they are regularly paid two or three dollars a month, and provide their own arms, matchlocks, and swords. The Jemedar, or Killedar, is a Beloochee also. The trade from Mombas is trivial; there is no fresh water in the neighbourhood excepting from wells. The town of Uzi, about twenty miles to the south of Lamee, appears the mart for the commerce of this neighbourhood; there the Gallas and interior tribes meet the Arab merchants. The Wonika tribe are located two days in the interior of Mombas. As a specimen of native names, I record the following designations of tribes of the interior to which the slaves brought to the coast usually belong:—Miban, Minquido, Mumwera, Makiwa, Makondi, Michinga, Mutumbi, Manyassa, Mubisa, Maumnesi. These people buy and sell each other; all are slaves, and slave dealers, as it were by turns. The coast people cannot tell which is the most powerful or influential; people of each tribe come down as slaves and as merchants,—sometimes, however, fighting just before reaching the slave marts of the coast. Frequently the natives of the interior come over to Zanzibar; intelligent European residents say that there would be little fear of treachery in accompanying them back to their country. As they do not know the use of money, they are dealt with in barter very much to the advantage of our Indian subjects. There are said to be forty to sixty Banians con-

stantly resident at Chibinga, a slave mart near Kilwa, noticed in the report on Kilwa.

Mombas is considered a very healthy spot. I filled water quickly, the authorities assisting me, in consequence of the Imaum's orders, free of charge; but I deemed it expedient to remunerate them for their labour, as native authorities are not particular in this respect.

Leaving Mombas on the 9th March, I reached Barawa in nine days, having to surmount a current which has impeded the vessel 365 miles in the latter seven days.

On nearing Barawa I was anxious to collect what information I could to guide inquiry. The latest edition of Horsburgh says as follows :—

Extract.—"Barawa is a town belonging to the Arabs, situated close to the sea, and *seems* well built. Of the river Jub or Govind (in the immediate neighbourhood) is recorded the treacherous murder, on its banks, of Lieutenant Mears and several men of the boats of her Majesty's ships *Leopard* and *Dædalus* when on shore for water; and the difficulty with which two men were recovered who had been captured by the natives, a ransom in the shape of arms, ammunition, and other things, being given to obtain their release." And says, "the perfidy of the natives should exclude European vessels from this place." In Marshall's *Gazetteer* of 1836, we find :—"Barawa, a republic at the south extreme of the kingdom of Magadoza, and the only one in Africa. It was founded by seven Arabian brethren, who fled from the tyranny of a petty monarch of Arabia. Finding a most delightful situation between two rivers near their confluence into the Indian Ocean, they built the city of Barawa, which is now large and populous, and the greatest mart on all the coast. Its merchants are rich, carrying on an extensive trade in gold, silver, elephants' teeth, ambergris, silk, cotton, and other stuffs. The republic is under the protection of the King of Portugal, for which they pay a tribute of about £20 annually."

Of Juba :—"A kingdom of Africa, with a capital of the same name, subject to the Portuguese."

Barawa :—Arrived here on the 18th March, at sunset; anchored about half a mile south-westward of a landmark or watch-tower, built by the Portuguese, on a rocky islet 200 yards from the shore, bearing at anchor landmark and Barawa town in one N.E. $\frac{3}{4}$ N.; southern extreme of land S.W. $\frac{3}{4}$ W. in nine fathoms sand; 1300 yards from the nearest shore.

March 19.—Landed for chronometric observations, which gave the minaret or landmark in 1 deg. 50 min. 17 sec. north latitude, and 4 deg. 19 min. 51 sec. east of Mombas fort. The latitude was ascertained by thirteen separate observations of stars north and south of meridian. In the evening landed at the town in an armed boat, to call on the chief and deliver the letter of Imaum Seid Seid of Zanibar, together with the letters relative to the wreck of a buggalow having British property on board which was very urgently wanted at Zanzibar.

I was received, to my surprise, in a warm and friendly manner, and conducted to the best-looking house in the place by a Somali chief named Hadjee Awisa, who carried in his hand a highly-ornamented sword, which I was afterwards informed was sent to him by Seid Seid. I had not been seated many minutes before a man of a very unpromising appearance, with large features and a dead yellow eye, his unusual height somewhat lessened by an ugly stoop, came towards me holding some papers, which, after the usual compliments and inquiries, and seating himself, he unceremoniously presented for perusal. These papers were very important documents for a stranger intent on examining the country in the neighbourhood and gaining information; the first gave the bearer a high character for honesty and fair dealing as a broker, or agent for purchasing cargoes, hides (principally) and ivory; the next happened to be a statement written by the harpooner of an English whaler-boat, acknowledging the great kindness and attention shown him by the bearer "Dera," he having, with five others, when chasing a whale, unfortunately lost his ship, and making for the nearest land, reached about sixty miles north of Mugadushu in nine days. Two of his companions having died from exhaustion, and the officers expiring shortly after reaching the shore, they were brought down to Mukutshu by the natives, and, I fancy, sold as slaves unknown to themselves. "Dera" said he rescued them from the people of Mukutshu for thirty German crowns, which is probably true, as the statement says that they were badly off until their arrival at Barawa. I made arrangements at once to visit the river in the neighbourhood, said to be two hours off at the back of the line of sand hills of 150 to 250 feet elevation, which abut on the sea shore hereabouts, forming a continuous line nearly parallel with the breach, at about two miles distance. Having satisfied myself that the people were well disposed, I returned on board, taking with me the man who engaged to be my guide for the morrow.

March 20.—Before daylight started from the vessel. Passed the town, which is a mile from the landmark, before sunrise; being joined by Sheik Awisa, before mentioned, who declared his determination to accompany me. I found him a very amusing but vain-glorious companion; he had the fine classic features of the Somalies, though very dark in colour, and hair somewhat crisped. We saw two kinds of antelope, the one of a spotted fawn colour, with spiral annulated horns, standing somewhat higher than the largest sized goat, the other, "Salt's antelope," very numerous. Of birds, there were a large brown hawk, the bare-necked vulture, the gigantic crane, another species usually called "the common stork," having a red bill and black about the covert feathers of the wings, besides honey birds of every hue, the green and gold flashing in the sun as they flitted past. Proceeding direct to the cultivated ground on the banks of the river, we found the country was artificially inundated two miles from its banks, though the alluvial soil was found within half a mile from the sea beach, and Indian corn and juari flourishing nicely. The stream being still distant, we retired

under the great shade of a large acacia, which trees at this season are in full flower. Skins being spread on the ground, all were soon seated, and the hospitality of our host produced excellent mutton boiled with rice, the only peculiarity being that the slaves seated at some distance were eager to receive the bones picked by their masters, which underwent a second, third, and fourth gnawing from successive hungry mouths before they were finally scattered as useless. All these people eat solid fat in large quantities. The first course, as arranged by the Sheik's kind officiousness, was a large bowl of rice, on which ghee was poured, and then boiled meat piled up: the latter soon disappeared, and a small proportion of the rice with it: neat lumps of fat were piled on the rice in a similar way to the meat; they disappeared as quickly: the remainder of the rice was then deluged with milk and the bowl emptied, the whole occupying about five minutes. (I beg to say I was a spectator merely.) The meat, after the Abyssinian fashion, was crammed into the mouth, and then a knife passed through it close to the nose and lips, no man taking time to consider how much his mouth would hold, but incessantly putting it to the proof! A sheep disappeared amongst seven of them, for we had two strangers, old Somali persons of respectable appearance, who, after partaking of coffee, pronounced a sort of benediction on the provider of the feast, wishing him every blessing of heaven and earth, rain, fruitful seasons, and to his children's children honourable among men! The Somalies here eat coffee stewed in ghee, the bean slightly bruised only, and the husk unremoved. The docility of the slaves is remarkable; their greediness in receiving the bones of their masters' leaving has been noticed, yet they are the only herdsmen and shepherds,—the sheep are the black-headed variety. All went to sleep about eleven A.M. and rested till three, when we had arranged to start for the river. I found the whole of the people very communicative, but very ignorant even of their own neighbourhood, and continually making contrary statements as to distances, numbers, and qualities; what information I gained and could depend on, has been embodied in the rough sketches and notices of this neighbourhood.

It was a very fatiguing trip from the tree to the river; we were full three hours going and returning; but the muddiness of the ground was the cause, not the actual distance. A common short hoe was the only implement of husbandry in use, the slaves and their wives being the labourers, housed miserably in small half-roofed huts; their usual food parched Indian corn, and fish from the river. A large kind of catfish, weighing about two or three pounds, and a snapper of one and a half pounds, I purchased for a trifle. As we passed on, sometimes wading up to the middle in water, and always trudging over soft mud, with tufts of grass here and there to relieve the foot, numerous birds started from their perches: the white Egyptian ibis, rising in pairs, was conspicuous with its powerful black beak and neck bare of feathers; the kullum also, and two species of divers, besides every variety of crane—black, white, and slate colour. As we approached the edge

of the river we found it somewhat sunken in its bed, the streamlets of the swamped ground over which we had passed running into it. Numerous alligators frequent the stream, which I was told is now at its lowest, the monsoon rains being daily expected: we found it from seventy to one hundred and fifty feet broad, ten and fifteen deep, with a current by estimate of a mile and a half an hour, taking a turn west by south at the point where I was standing, having come from a direction due north, (true.) This elbow in the stream, by prismatic compass and estimated distance, is due north of the town of Barawa seven to eight miles. The country all round is spotted with trees, and appears level as far as the eye can reach in the interior. In returning we succeeded in shooting an ibis, apparently a young bird only just paired, the neck having a little remains of down and feathers on it, not so thoroughly *leather-necked* as the older birds become. Having passed the night in the open air, sheltered somewhat by a hedge on the windward side, under which the hides had been by my guide's forethought removed, I returned to my ship in the morning, having been very civilly treated by "Dera," he providing a breakfast of fowl, tea, and milk. I asked him again to let me see his papers, as I had imperfectly perused them before by lamp-light: they prove that Brava for fourteen years has been a welcome port to European and American traders, several of whom have resided on shore for days at a time—the chiefs, seven in number, say that Captain Owen's visit reconciled them to European intercourse. The river Jub or Govind is under the authority of the Sheiks of Barawa, who, on being closely questioned by me, mentioned every particular of the murder of the men belonging to the frigates that sent their boats for water during the expedition to the Red Sea: their statement, which agreed with an account I had obtained from an old fisherman two days previously, comprised the following particulars. The natives, (Somalies not Gallas,) on the banks of the Jub or Govind, on seeing the ships in the offing for some days, had prepared themselves to resist a landing, reading the Koran and using incantations to ascertain the intentions of the strangers. At first, when the men-of-war boats came on shore they merely watched them, but seeing that they commenced digging where the sand was most glittering and red, they supposed they wanted to find gold, and after consultation arranged by stealth to kill them. The last item mentioned, was that three men, the last of those who were present at this murder, met their deaths in a fight with a neighbouring tribe two years ago. I told them the men were digging for water, not gold; the ships wanted water, having had a long cruise. As there were the principal men present, and a changing assembly of about thirty others, I determined, on the spur of the moment, influenced by the candour of the people, (their account agreeing with that of the old fisherman,) to offer repayment of the sum of thirty German crowns which "Dera" had remitted to Mukutshu, to rescue the remainder of the crew of the English whale-boat as beforementioned; the offer was accepted in silence, and I trust it will have a

very beneficial effect. The genuineness of the statement cannot be questioned, but I may add that, before returning it to its worthy owner, I inserted a paragraph stating that the sum of thirty dollars had been paid him by me on the part of Government, as an equivalent for the expenses said to have been incurred on account of the unfortunate boat's crew; and I reminded the chiefs that any expense sustained for a similar purpose would meet a return, but it would be better to procure a writing under the hand of the sufferers mentioning the amount. I had asked why they did not procure a writing in the present instance? Their reply to me was nobly thrilling—"They were strangers and naked, could we ask them for anything?" Under all the circumstances, no vessel of war having visited the coast since 1823, I trust the Government will not consider the money thrown away.

The currents were still very strong, setting thirty-two to forty-five miles a day to the south-westward: the wind hanging to the north-eastward, it was eight days before we reached Moongnia, the only village noted on Owen's chart. Between Barawa and this anchorage is Fonre: it is a walled village, situated on an elevated peninsula overlooking the sea, consisting of about 300 inhabitants, herdsmen and growers of cotton; they are under the influence and protection of the Barawa Somali chiefs. Hearing that the river approached the sea nearest to a place called Galwen, represented as four miles from the beach at Moongnia, I purposed anchoring to endeavour to examine the neighbourhood, having sent a Barawa guide, whom I had engaged, on before in the launch with an officer to examine the anchorage; but finding the soundings extend only a small half mile from the beach, I did not at this season deem it prudent to anchor, the weather being squally and unsettled: the anchoring ground is good, being soft sand and clay at a depth of eight and nine fathoms, but deepens suddenly to no ground at thirty fathoms. In the north-eastern monsoon I apprehend there would be no danger in a vessel anchoring abreast of the weather reef, under the protection of which a boat can nearly always land in calm water. The anchorage is a good one for country craft, there being a break in the reef which runs parallel to the shore about two hundred yards distant, having one to three fathoms inside of it. The day subsequent to the landing of the Barawa guide, I went on shore early in the morning, and, to my annoyance, learnt that the people of Galwen had threatened the guides with instant death if they brought a Feringi to their town. Foiled in this attempt, I remained about an hour on shore conversing with people who had come from the town, and visited the ruins of an Arab settlement, which was once of considerable extent, but, as I was informed, suffered so much from the petty wars of rival Somali chiefs, that the inhabitants returned to Barawa. The country on shore here is spoken of in raptures by the people—they liken it to Burorah and the banks of the Euphrates. The sugar-cane and all Indian fruits grow luxuriantly; among others a delicious wild fig is abundant, the plantain, pomegranate, cocoa-nut, melons, tamarind,

almond, Indian corn, and juari, are abundantly cheap, eight Bengal rice bags, or 1280 lbs., being sold for one dollar. As I had an opportunity of explaining to twenty or thirty men belonging to Galwen who were friendly in their manner, (though a few showed much astonishment and fear, not having seen a white man before,) that I came with peaceful intentions, though the boat's crew were armed, I could appeal to the vessel, she being two or three miles in the offing, as a proof that I did not come for war, and, making a small purchase of grain, (juari,) I returned on board by ten A.M. and anchored off the town of Merka the same evening, losing one day in this abortive attempt. I had proposed, when ashore, to ascend the sand hills, which rise two or three hundred feet in height here (as everywhere else along this shore,) and look down on the country on the other side, it was not an hour's walk; however, the guides said they would suffer hereafter if we were seen to do so by any of the town's people.

April 1.—Landed at Merka for chronometric observations. Here I was received civilly by an Arab merchant of respectability, to whose house the heads of the Somali tribes of the neighbourhood came in the course of an hour or two; one chief was wanting. I heard he was the principal, but now bedridden from age, and I waited on him in the evening: this trivial circumstance had an excellent effect, however. I found the Sultan, as he is styled, of Merka, seated on bullocks' hides, (in one of the round Somali huts, opposite to a little window.) I say hides, as the only visible distinction between his circumstances and those of poorer men, consisted in perhaps a dozen hides being placed on each other to form a bed, instead of the single one sufficing. He is blind with age. I told him I had heard he was unable to leave his house, so had come to call on him: he was profuse in his expressions of good-will, and insisted on feeling my clothes, and keeping his hands on some part of my person, while I remained (he had never seen, and, poor man, was not destined to see, an European.) Telling him I had come in peace, and wanted a few supplies, and to go up and see the country, he said he could not answer me that, the elders of his tribe would; that, please God, I should obtain all my wishes. The following day the chiefs presented the ship a bullock, for which they received a return in cloth, as per appendix. I then told my host, the Arab merchant, that I wanted to go to the river in shore. He said it would be impossible to go without the Somalis' good-will. I then told him to call them all and consult; they met and agreed to guarantee my safety, and provide a guard, (which they stated would be absolutely necessary,) but that I must make them a compensatory present, as no European had ever penetrated the country here. I consented to give them fifty dollars: in mentioning this I ought to say that I consulted with two parties and my Barawa guides, and did not agree to make them the present above-mentioned until all other means failed. As the vessel was watering, and one day would suffice to go to, and return from, the river, I determined immediately to go, and alone, as though I apprehended no

risk, or little, yet I conceived it better to show confidence in the people at the onset. I may mention that the friendly chiefs of Barawa, when bidding me "God's peace," had cautioned me not to go on shore at Merka or Mukudesha, and this evening the two Barawa guides (who have been abused and threatened by the Merka townsmen for bringing the Feringis, as they say) earnestly begged me not to go, one trembling and literally crying, though twenty-one years old. He became more composed when I told him that he need not accompany me. The river is represented to be three hours off, which is about ten or eleven miles. I have arranged to start early, and propose returning before night.

April 5.—My safe return has caused much joy in the town—all the people were out to welcome me back, the women and children on the top of the houses, and the men, to the amount of two thousand, advanced nearly a mile from the town. The principal cause of this excitement appears to be that they apprehended the slaves, or rather self-liberated free men, of the interior, would treacherously intercept my return, and then they would suffer from the ship; the time of day, however, near sunset, favoured this demonstration of feeling. When first, from the brow of the hills overlooking the town, I descried the multitude advancing, I was rather anxious, and so were my companions; they instinctively stopt a few minutes and consulted: proceeding at a slower pace, we soon distinguished that the people were unarmed, and that mere curiosity had led the greater number from their houses; but it is necessary to detail my journey. Not being able to get away before seven A.M. instead of five as I had wished, about one hundred men collected, and accompanied myself and guard of nine men to the suburbs. Here the other Barawa guide faltered in courage, and pretty plainly said, "He could be of no use, and did not wish to go with me." I immediately sent him back to the town, thereby placing myself wholly in the Somali guards' hands. I carried pistols, sword, and gun, and selected the man, who appeared the chief, as my companion, keeping him in conversation by means of Arabic, and we walked together nearly the whole way.

Leaving Merka, which is a stone-built town of about three thousand inhabitants, evidently founded by Arabian traders, we proceeded over the sand hill, which backs the seashore here as elsewhere. On reaching near its summit at about two hundred feet elevation, and one mile W.S.W. from the town, we found excellent water four feet from the surface in half a dozen places. Looking down on the country beyond, it presented every evidence of great fertility, and some degree of industry—green Indian corn and millet were waving to the gentle land wind; other places of cleared ground showed the labour of the reapers was over for a season; grain, I was assured, ripened all the year round, yielding from eighty to one hundred and fifty fold. The harvest-home of the slaves is here kept up by singing in procession through the streets of the town, a few dancers preceding; it ends by a feast and presents from the masters. After passing over the soft surface sand of the hills, we descended to the lower cultivated ground, and soon

came to labourers. I stopped to watch their labour—they were thrashing the grain; the heads of the millet had been plucked by women and children, and brought on donkeys to a cleared, hardened spot, protected from cattle and dust by a circular hedge formed of the prickly branches of the acacia, mixed with the straw of the grain: when the space was sufficiently filled with the heads of grain, strewed three or four feet deep, thirty or forty persons with flails (a stick slightly curved at one end) commenced the thrashing, with their faces outwards; they worked away, treading, and thrashing, until they met back to back in the centre of the circle; when women and children collect the stalks, and winnow the grain in heaps, merely waiting for the usual sea breeze to scatter the chaff as they toss it in the air; it is then packed in baskets of a particular form, and supplies the whole coast of Hydramaut and Oman. Here I saw an instance of severity of treatment to a runaway slave: he had heavy shackles on his legs, had been so three years, allowing him to move ten inches only at a time; he was carrying water to the labourers at a distance of four miles from the well. At about five miles from Merka there were large herds of cattle, which pastured roaming over tracts uncleared for cultivation (the straw of the grain being burnt on the ground.) The slave in chains was offered to me for twenty German crowns, but I declined without assigning a reason. There were many thousands of men employed in cultivation here; their only housing is the loose stalks of the common millet piled in a cone, admitting of three or four persons sitting in the interior sheltered from the sun, but pervious of course to rain: families pass their lives thus. On surmounting a slight rising, the course of the river could be traced by a line of large trees along its banks. The green of the country was refreshing to the eye, all was verdure or lately reaped ground, the country in the distance freely sprinkled with trees. At eleven A.M. we arrived at the village on the banks of the stream: here I first saw the neat conical roofed house of the natives, of which the village consisted of about one hundred; it is superior to a mat-hut, in appearance externally, and in the skill displayed in its erection: the village had a wall of piles driven in the ground close together, reaching a height of about four or five feet, in addition to the prickly pear-bush planted in close array on the outside, which is no contemptible defence; the wall had two narrow breaks or openings without gates. The heads of the village came out to meet our party, increased on the road to twenty-two spearmen; one man was deputed to arrange for our peaceful entrance, while we halted. Curiosity and merriment awaited me from the fair portion of the inhabitants—a sheep was killed, and milk produced without being asked for. The stream here is one hundred and fifty feet broad, two feet only sunk in its bed, though they say this is the dry season. I passed three hours on the banks of the stream under a large fig-tree, swarming with birds of the most brilliant plumage, principally a kind of yellow sparrow: there were three cocoa-nut trees in full bearing, and two large fig-trees in the

village; even the ever waving leaves of the lofty palms were clustered with birds'-nests, so much did the feathery tribe court the neighbourhood of man. I walked in the country some distance on the opposite bank of the stream, but found it an entangled thicket of high rank grass and stunted trees: the depth of the stream I ascertained to be seventeen feet, two or three miles an hour current, the hippopotamus and alligator being its larger occupants; the natives use both traps and a rod and line to catch fish. The ferry consisted of a single boat uncaulked, made of six rough hewn four-inch planks, rudely tied together, in the form of a large open chest; the rope was a fibrous creeper from the jungle, knotted in twenty places. The inhabitants looked healthy, clean, and were particularly merry and cheerful at my expense; taking my hat off created a burst of laughter, &c.: they had never seen a Feringi before. No instance of ill-will was evinced towards me. I took pains to show everything at all curious in my possession to the inquiring among them. On returning, three head men accompanied our party about a mile outside their village, and uttering a benedictory prayer, to which all responded, we separated in peace. There is no doubt that this river is the same as the Barawa one: it carries down a reddish fertilising sediment, the surface water being copiously impregnated with it; fuel is abundant on the banks. The guard on returning were more friendly and communicative than in going; they halted several times out of consideration for me, though I bore the fatigue as well as most of them. We returned to Merka before sunset, thus accomplishing twenty miles and upwards since morning. So far I am satisfied of the existence of a river whose stream and body increase in force and volume as we advance to the northward. The compass bearings and observations are embodied in the plan. I gained much information from various classes of natives here at Merka, and also succeeded in obtaining some knowledge of the routes and tribes of the interior from two natives of Burbarra, (the Somali port directly opposite Aden,) who had but lately arrived with a few head of cattle and sheep for sale, carrying back cloth and tobacco. It is useless to detail all the means I used, and the trifling presents I gave to different persons, to obtain information; I trust all that is useful is embodied in the map.

April 6.—Having taken in 2300 gallons of excellent water from a well 100 yards westward of the town, and 200 feet only from high-water mark—started for Mukudesha, (after a delay of four days,) to enquire further as to the destination of the property lost in the buggalow, reported to be wrecked still higher up the coast. The natives assure me there is considerable waste of river water by its percolating through the soil and running into the sea at many places from Barawa to Mukudesha; excellent water is certainly everywhere abundant on this coast.

The current still adverse, or to the westward; passed several "bedus," or the peculiar Arab trading boat of these parts, carrying cargoes of slaves to Oman. They usually put in here, as it may be styled the grain coast for the supply of Southern Arabia, to take in a cargo; the

profits are enormous—300 and 500 per cent. in a passage of fifteen or twenty days. They come down, however, in October with their dates and cloth—employ their boats for hire to carry slaves to Zanzibar, to bring wood for house-building, and in fishing, and return to Arabia early in the south-west monsoon. From Merka to Mukudesha the range of sand hills still continues rising more or less abruptly from the beach; the various villages between these parts are entered on the map, with remarks of interest; the coast has a barren aspect from the sea, but beyond the sand hill range all is luxuriant vegetation.

Anchoring at Mukudesha in the forenoon of the 7th, one of the guides was landed to inform the Sheik that I would wait on him; he said he would meet me. I have added, by way of addenda, all the information I had of the usual conduct of the natives: and thinking display might have a good effect, the boats were manned and armed, and when at the back of the surf, a salute from the launch's gun was fired in honour of the Sheik; the beach was crowded with armed men. I had procured letters of civility from the Sheiks of the Merka tribes, in addition to the one from the Imaum of Zanzibar, and was not disappointed in a most friendly and even warm reception. I had heard at Barawa and Merka of Mukudesha as a most treacherous place, and dangerous even for a person to land at; so I had prepared the marines to accompany me on shore.

Owen does not appear to have landed here at all; Horsburgh expressly says the natives are hostile to Europeans. The only record of one of our vessels visiting this town is the case of the *Albemarle*, whose boats were fired on in attempting to open a communication with the people. The surf on the beach induced me to countermand the landing of the marines, excepting four who came in one of the quarter boats. I very soon found that I had called on the Sheik of a party not holding authority over all the town; his nephew had been elected chief of a large portion of the town by the sedition of some of the Somali chiefs. Neutral ground of perhaps 100 yards in extent, occupied by ruins of buildings, separates the lordships of the uncle and nephew; the trading boats of neither party can be employed—they are housed in on the beach.

The chief presented me with a bullock; and an Arab merchant, a shereef, offered me lodging, inviting me to stop on shore.

Mukudesha, once the capital of a kingdom, is now half in ruins; it contains 3000 or 4000 inhabitants, Somalis, with perhaps thirty families of Arab origin. Here the Somalis are residing in substantial stone houses, that neither they nor their fathers ever built: four watch-towers, &c., or perhaps belfries, with interior spiral steps of superior construction, evince the former reign of the Portuguese; but their remembrance has passed away from the present generation. One building, which was evidently a church or chapel, with its aisle and chancel, contains a black marble slab bearing an inscription recording the piety of a shereef who repaired it and dedicated it to Koranic devotion—the

worshipper modestly saying the deed was undertaken in hopes of meriting heaven by its performance. The town has a ruinous neglected appearance from the offing, and on entering it the filth and poverty which present themselves are both distressing and offensive. Hearing that the river rolled by in the neighbourhood, I determined to remain on shore and prosecute inquiries; the burly shereef, who would match in port and appearance with any fat priest in the world, gave me a kindly reception. His house is three stories high, flat-roofed, with dark narrow stairs, but capacious rooms, and might, if kept clean and furnished, be made a very tolerable dwelling; the windows were small, some had Venetian blinds, all wooden shutters; the only furniture hides stretched on wooden bed-frames, and a strong chest. An arrangement was soon effected with a messenger to carry a note to the chief residing on the river with whom I sent one of the Barawa guides, telling him I had a present for the chief, who was described as a pompous man, very vain of his learning and reputed good fortune. Returning on board the following day, April 8, I made arrangements to land fifteen men with muskets to accompany me as a guard—following in this the advice of the Somali chiefs of Merka, (who I presumed, from the nature of the caution, had some inclination, when I was in their power, to play me false.) Aware as I am that there is considerable responsibility incurred by me in taking an armed force on shore, I now record my motives:—

1*st*, Security to my own person in carrying out the wishes of my superiors.

And, 2*dly*, To establish British influence with the natives of the interior, nothing but a display of force can effect these objects. The people here, that is the present generation, have never (with a single exception) seen a white man; there is record of three only having landed at Mukudesha—all agree in saying that the Sheik of the interior and his people have never seen one.

April 8.—The guide having returned with the chief's written permission for me to proceed, I landed; but the surf being high, was obliged to order the other boats back. I found ten spearmen had been sent down to accompany me back to the Sheik; they had been six hours coming, so I hope to go there during one night and return the next.

April 9.—No communication with the ship, the surf very high.

April 10.—In the afternoon, Mr Metcalf went off in a large native canoe, and, although swamped in the surf, succeeded in getting on board the ship; rain came on heavily, which allayed the swell somewhat, and the boats landed in the evening with seven European musketeers and seven sepoys, and I prepared to start at once, being accompanied also by Messrs Robinson and Metcalf.

April 14.—Returned, having completely effected both objects; walked up the river's bank (now increased to a noble stream) for ten miles, and visited six considerable villages: we were detained by the

absence of the Sheik one day and a night, and the fatigue the men experienced made a rest of thirty-six hours necessary—the sepoys suffering more than the Europeans. The distance, twenty-two miles, was greater than I had supposed; but to detail the journey:—Quitting Mukudesha at 6 P.M., having ten men of the town to carry necessaries, and ten others, the guard from the Sheik of the interior, the party from the ship being seventeen muskets, and three Arabs (a guide, the ship's pilot, and interpreter.) Pushing on, with short intervals of rest till midnight, the guide recommended a halt near a supply of fresh water. The plan was for the Europeans to accompany me immediately after the guides, keeping all together, and the naique and six sepoys to bring up the rear of the baggage carriers. At 4 A.M. started again, but were overtaken with rain before daylight, which wet us to the skin; we were all on foot, and the mud began to be very deep. As soon as the guides could see the way, pushed on till within a mile of the town; halted to put the arms in order—all right but one musket; entered the town just at 8 A.M., fired a salute of three volleys, in the presence of about 7000 spectators. Having to cross the river in the ferry boat to enter Giredi, the capital of Sheik Sultan Yusuf bin Mohammed, as he styles himself, requested permission to have a house given us for dressing in, as we were wet, &c. Four very tolerable houses were given up at once; they were of the round form, with conical thatched roofs before described. Having refreshed a little, I sent to say I was ready to receive the Sheik, who had been importunate to come and see his visitors—sending several times to know if we were ready. When he came I excused myself from using any ceremony, as we were all tired; he said he was honoured by the visit, the town was ours, we might do what we liked, &c.; and remaining only a short time, said a bullock had been killed already, that any thing I wanted I had merely to mention it, myself and party being his guests; and he kept his word very fairly while we remained—sending us milk, rice, and a sheep every day, his own people cooking for us. We returned his visit in full dress in the evening, the party under arms, and fired a "*feu de joie*" at his door, having a boat's red ensign displayed. The chief is a tall man, of intelligent countenance, about forty-five years old, dressed only in a large white cloth loosely thrown round his person, and brought over the head and shoulders so as to envelope the whole body, from the ankles to the crown of the head; he wore sandals, and had a small spear in his hand, and the eternal tooth-brush stick; with a shaven head, and a scant beard round the edge of the lower part of the face—the moustachios, the imperial, and all stray hairs of the cheeks being carefully plucked out by the roots, (such being the universal custom of the Somali nation,) and such was the chief. Judging by him, and the principal people here, the Somalis are not a thick-lipped race; they are black, with crisped hair, straight noses, and well-proportioned head, features, and limbs; in the lower order there is so great a mixture of the slaves and Gallas, that it is impossible to distinguish them from each other. As the noble-looking chief watched the "present

arms" of the musketeers, he was evidently discomposed, his eye anxiously flitted from one soldier to the other, and he no doubt felt relieved when they were marched off. I had presented him with a pair of percussion pistols, an English carpet, several yards of blue broad cloth, an Abyssinian chief's cloth of very fine manufacture, a silk turban, &c., and asked him for permission for all Englishmen to trade to, reside in, or travel through, places subject to his authority; he gave his immediate full consent in the presence of two other natives. The whole country is about to follow at the heels of Sheik Yusuf, to annihilate the fanatical folk of Barderh, and burn their villages to the ground.

The people of Barderh have often provoked a crusade of the sort by their aggressions and plundering propensities, under the specious pretence of reforming the customs of the people. The Arabs of the seaports like the Barderh chief best, as he respects their Shereeffs and Saids, and adopts Arab customs. Sheik Yusuf also asked me to level the rebellious half of Mukudesha, reasoning thus—"How can you do wrong, is it not mine? And you have my permission; we have made friends; the chief and people of Hamerwen, as it is called, are my enemies, they are your enemies." I explained to him, that though his *permission* was given, I had a sovereign whose order was necessary before I could act as he wished;—that we English act by orders,—who is to order me? "You can only permit." This conversation explains how it was he used Her Most Gracious Majesty's name in the written paper attached. I am not responsible for the style or manner of its insertion. The chief's brother paid me a private visit, and proposed to me to assist him and land with one hundred Europeans at Minguia, and establish it as the grain port of this coast. I conceive this was not asked in sincerity, it was said merely to ascertain my object in wishing to see Galwen. The chief came over to my quarters the day previous to my leaving his town, and remained for three hours conversing very familiarly, asking questions, indicating a great desire for further intimacy with, and information regarding, Europeans. Everything I had—to the knitting of a stocking—I explained as carefully and lucidly as I could: the lion's head on the hilt of the uniform sword, struck him as so peculiarly appropriate, that he harangued the bystanders for some minutes on its emblematic meaning. His own shoes were of camel-leopard's skin; his dress of cotton, the growth and manufacture of the country; the armlet he wore under the right arm was exceedingly neatly plaited of narrow strips of the delicate skin of "Salt's antelope," stained a dull red; his food is milk and flesh meat, with stewed coffee and millet in the morning. No Somali eats fish, unless he has lost all self-respect; many do not learn to eat grain even; they are essentially a pastoral people. The chief and his two brothers, Sheik Musa and Hadjee Ibraham, are all six feet in height or upwards, well formed, aquiline noses, fine lips, but crisped hair.

During our stay, there was a holiday on account of a Zingara, or in commemoration of a saint. The amusements of the people were rational

and pleasing; dress, music, dancing, singing, and feasting; the dancing almost seemed a sacred *duty:* in many instances gray-headed men, with the peculiar dress which Hadjees wear among this people, joined with gravity and slow but harmonic movement in the rejoicings; no arms were seen, the usual spears were put aside for the drum, wooden cymbals, and to join the dance; the rude music was aided by the voices of a choir of women to each set of dancers: the occasional swell of the united voices was really fine. I became a spectator for two or three hours before dark, and stood by the largest knot of people: there were twenty sets of performers, each with perhaps three hundred bystanders. Men and women joined in the dance together, crossing from side to side; there did not appear to be any choice of partners, anybody entered the ring to contribute to the exhilaration; all was smiles and perfect propriety. The women cover their breasts by means of the end of a second cloth being brought under the left arm, carried over the right shoulder, and tied to the waistband; a handkerchief envelopes the hair, no part of which is seen. The housewives of this community do not use a needle—no part of their dress requires it: thus the fair are clothed as much as the women of India, and to judge by their liveliness in the dance, and their really harmonic musical efforts, hold a more rational position in the Somali society than they do among other Mohammedan nations, allowedly more civilised in most respects. Finding I attracted much notice, and was the cause of scolding between my guide and some few of the more enthusiastic dancers, whose performances were neglected for the more novel sight of a Mirzungu or European, I retired to a rising ground. If the reader could imagine himself beside me, he would partake of the pleasurable feeling with which I yet regard the time I spent in watching the overflowings of joy, and the exuberance of spirits, displayed by the masses of human beings between me and the noble stream a few hundred feet behind, ever flowing, ever blessing where it flows! and, under God's providence, the principal cause of this people's present happiness, ensuring abundance with very moderate labour. I looked down on five or six thousand men and women, who alternately kept up their music, dancing, singing, and processions, till daylight next morning. An Arab would be pained to the quick—scandalised by witnessing this spectacle among a professedly Mohammedan population, but it is rational and innocent in itself; indeed, my Arab guide, when I appealed to him if the Barderh community would stop these amusements? with indignation and flashing eye, replied, it is better that this people should die than women thus be suffered to dance with men. At least ten thousand men have fallen in war within five years to determine this important question; the men of Barderh were in the last fight successful; Shiek Yusuf hopes, however, this month to exterminate them. Such are human motives and human actions!

The kingdoms of corresponding latitude on the west coast of this great continent are of that bloody, despotic description, which savage

nations alone submit too: here the government is mild. Though, with a moderate computation, deducting three-fourths of native accounts, this great Somali chief could bring 20,000 spearmen into the field,—perhaps 50,000 if he made large promises to, and flattered the more republican spirited districts, which, however, now nominally own his authority, and are certainly not under the dread or influence of any other Sheik.

The supreme authority has been hereditary for several generations in the present chief's family, and his authority is very firmly established; if successful in his projected expedition against Barderh, he will command the whole province from the Jub to the Haines river. There is every probability of his success: if defeated, he will lose his influence over the sea-coast as far as Merka to the southward, and also his authority at Gawaneh, the frontier station towards the Gallas of Liwin, as the Barderh robber has formerly extended his reforming arms to those places. The Sultân of Barderh was successful in his last attempt on Barawa, extorting 500 dollars or so, and driving off cattle; his soldiers defeating twice their number of Barawa Somalis just outside their town, and killing perhaps two hundred of them on the route: this occurred three years ago. Dancing is given up at Barawa, and the women wear veils and shirts. Tobacco is used only in secret. Sheik Yusuf in revenge burnt three villages that adhered to Barderh, and would have proceeded with force to restore Somali customs to Barawa, but the townsmen very reasonably said—"We will return to our late customs most willingly, but when you are absent we cannot resist the power of Barderh: it is the part of a great chief to conquer the author of our present apparent want of allegiance to him." This representation, accompanied with a trifling present in goods and money—two hundred German crowns—soothed the mind of Sheik Yusuf, and he withdrew to Yaredi. He has been ever since talking of exterminating the Wahaby horde of Barderh, but they have increased in numbers latterly, as they are continually plundering the Wardai Gallas of the opposite bank of the Jub. This is the state, as before-mentioned, he so earnestly pressed me to assist him against.

To finish this branch of politics, I may refer to the rebellious position of one half of Mukutshu, under the nephew of the hereditary chief. Sheik Yusuf, a few months ago, descended with some eight thousand men to settle the dispute, but being appealed to as umpire by both parties, gave his advice, but refused to act, seeing the affair would be bloody and doubtful. For this moderation on his part, as it is usually regarded, he has received much applause; but the secret history of his failure is, that he had reason to doubt if one half of his rabble soldiery would fight against the inhabitants of Hamerwen, as, being of the same tribe, no captives could be made of women and children, and cattle there were none; however, when requesting me to bring about peace at Mukudesha, he said that no firing would be necessary, only to threaten and they would submit. This chief has a

great idea of maintaining a character of being fortunate in all his undertakings, and by exaggeration, to affect the imagination of his subjects: as an instance, he said I had given him the richest merchandise of India, and should receive every honour, and ten bullocks to carry back to the ship. I only saw two, but he said others were coming, and urged me to delay my departure for them.

The day subsequent to arriving at Giredi, we set out early to explore; Hadjee Ibrahim, the sheik's brother, accompanying us. Following the sharp angular windings of the stream, (each reach is seldom more than a mile long,) we frequently saw the hippopotamus basking, or under the shady banks, in numbers together; when disturbed by the discharge of a musket, they uniformly swam against the stream, advancing by a succession of dives as it were, throwing up their hind legs above water as the porpoise does its tail. Their footprints were numerous for a considerable distance from the banks of the river, and the natives represented them as very destructive to their cultivation. The alluvial soil of the river extends to the sea-beach; indeed, the valley of the left bank of this river is a vast alluvial tract. On the right or continental bank, circumstances did not admit of my proceeding more than a mile or two in the neighbourhood of Giredi: both banks were cleared and under cultivation. The wild fig-tree was clustering with savoury fruit, which is in great abundance. The ground, where not subject to the hoe, produced wild flowers of great delicacy of tint, and brushing through the shrubbery under the spreading fig-trees, aromatic plants diffused their odours of an almost startling sweetness. The fig-tree affords timber for ferry boats, but is only suffered to stand on the very banks of the river, all other grounds being cleared for millet and Indian corn, and here and there the sesanum is reared with care and trouble: the castor oil-nut tree is wild. I did not have an opportunity of ascertaining the revenue, if any, which the sheik derives from the labours of the people; he appears to expect presents from merchants and strangers visiting or passing through his country: his warriors have no reward but plunder, and no stated provisions, even when in the field. The poisoned arrow is used in both war and hunting, but among the inhabitants settled in communities there are few archers compared with spearmen—perhaps three per cent. The only men armed with bows and arrows that I met with (about twenty) were uniformly young and very short in stature.

A good opportunity was offered me of judging the amount of population, as whenever we approached a village our guides urged us to discharge firearms to *astonish the natives*, (to use a trite expression which can be more appropiately used.) These people are essentially good-natured; they would submit their heads for examination like children. Some young fops among them dress their hair most tastefully, or at least elaborately, approving very much of our naval cocked hat for form, or sometimes bag wigs and mops in turn receive the same approving imitation; none but the interwining crisped hair of the

negro would maintain the form which they arrange their heads of hair in. The neck crutch, which is universally carried by the men when absent a few hours from their houses, supports the head comfortably five or six inches off the ground, when repose is desired.

The campaigning or travelling kit of a Somali spearman is as follows:—One cloth of cotton, six yards long and two wide; sandals of camel-leopard's hide, which is found to be light and very durable; a calabash of water; a neck crutch, a quantity of tobacco, a pair of tweezers, and a tooth-brush, carried in a leathern bag, slung by a becket close under the left arm; two spears, a shield, and sometimes a knife complete his equip: of the spears one is usually small and light, for throwing, the other broad and heavy, which is never thrown; all the manufactured articles are from their own community. They depend on India for cotton in the raw state in a great measure, on Arabia for coffee in *the husk, and dates*, and on all countries for tobacco, (which they cannot do without.) The returns, of grain, gums, hides, ivory, rhinoceros' horns, hippopotamus' teeth—the value of the latter is little known. The natives took us to see the carcass of one that had been dead four or five days; his tusks were removed before our eyes to be sold to us; but for our visit they probably would not have been touched.

The double-horned rhinoceros is very common; a fine specimen was purchased for 1½ rupees. It had only just been brought in, the hide about the roots of the horns being quite fresh.

The continued windings of this stream would make it tedious to ascend in a steamer: the appearance of the banks would, I have no doubt, be an excellent indication as to which side the deepest channel would be found. The water during this season was turbid at each place of the river visited, a rich red loam being held in suspension; but the natives stated it sometimes ran by quite clear; but I could not ascertain under what circumstances. When out in the village some miles from Giredi, the behaviour of the people, old and young, was most pleasing and natural; everywhere curiosity, good humour, and hospitality met us: if milk, pure and new, could hurt one under exposure to the sun during its meridian heat, I and those with me ought to have suffered. As I had determined to see and be seen as much as possible, to impress a recollection of our visit, I travelled about more than was quite agreeable; but the novelty of adventure, and general kindness of all classes of the people, was more than a recompense; several opportunities offered for making trifling presents for considerate voluntary acts, which excited good feeling on both sides, and made the Company's rupee known as a coin in a part of the world where it never yet had been introduced. I did not forget to explain whom the stamped bust represented, and hung several round the tawny necks of the daughters of the land, in return for bowls of milk and honey they were all forward to present us with.

We offered four dollars to the natives of a village about eight miles,

by the river, from our habitation at Giredi, to take us down by water; but after a consultation, the people said, "You want to shoot the hippopotamus—what if a wounded one attacks the boat, and you are all thrown into the river;" this would, indeed, be a Mungo Park's fate! I did not press the point; more money would probably have overcome their scruples, but I did not try its effects. Quietly crossing the river, we returned by the opposite bank to our dwelling. We saw a family of monkeys—two or three old ones with bushy manes, and many younger ones of all ages; they were of a large brown sort, standing as high as a mastiff. The fowling-piece was more than once presented at the larger ones; but each of us, in turn, dissuaded the others from firing, as, in case of being wounded, they cry so touchingly. The natives are delighted with the sound of firearms, and urged us to fire, saying the monkeys pluck the heads of Indian corn, &c.

Ant-hills and the wild bee's nest were frequently met with; the burying-beetle, lizards, the chameleon, and birds' nests pendant from the branches of trees over the stream, were numerous; the hues of the birds are beyond description—brilliancy of colouring does not convey an idea of the ever-varying richness of the tints of their plumage as they gleam in the sunshine. The whole country is of the richest soil; indigo, cotton, and sugar-cane would no doubt thrive, but the inhabitants say, (and perhaps truly,) "were we to have all these things the Arabs would take our country from us."

Whilst standing on the banks of the river,—which, I may here remark, has no native designation, nor have the Arabs any general name for it, so I take the liberty of introducing it to the scientific world as the "River Haines," or "Haines' River," as a small tribute of respect to his (Captain Haines's) unremitting zeal for the advancement of geography; and also his established reputation as an able man and scientific officer will justify me in thus testifying my personal esteem and regard for him as a friend,—I have appealed to natives who have been in the habit of visiting the Jub at Gawaneh, (see map), and their testimony concurs in representing that the Jub is twice the width of the Haines, or about 500 feet broad; and that in the dryest season (*i.e.* in February and March) it is fordable, but when the rains commence, or towards July, it is very deep. I beg to repeat, I am assured that Gawaneh (as well as other principal villages) for convenience, is situated at or close to a ford, *i.e.* at a shoal part of the river's course.

The villages here, at the distance of a mile or so, embowered in lime and fig-trees, from the conical shape of the huts, bear a striking resemblance to a cluster of bee-hives. The style of the hut, which I have only yet casually mentioned, is of the Timbuctoo character, not of the pastoral Somali—bent twigs covered with mats or hides, but supported by a stout central post; the roof is usually thatched with grass, terminating, not in a point, but at a ring of twigs three or four feet in diameter, under which two or three rows of a particular matting is put, which shuts the top and glances off the rain; about eight feet down the centre

post rays are thrown out as a further support to the roof, the lower ends resting in niches cut in the post: the circular wall, which is about six feet high, is formed of two rows of small posts at about ten inches apart, each row is then entwined with the rope creeper, as it may be called; they form two concentric rings, the inner one being highest, enclosing a space about eighteen feet in diameter; the interstice of the rings is then filled with clay from the river, which hardens tolerably: both outside and in is smoothed and plastered over with the whitest clay they can get, which adheres firmly, and preserves its whiteness inside somewhat, but the weather and rain turns the outside brown. The house has only one door, and no window: the interior is divided by a mat or hide partition for the privacy of the females; pegs are used to hang things on: bed frames and earthen pots from Kutch are their only utensils, besides the hand-mill and grain-pounder of India. I can testify these houses are delightfully cool, and not so dark as might be imagined. There are generally two or three houses in one compound or enclosure, and the habits of the people are certainly cleaner than those of the natives of the sea coast. The population is rapidly increasing, and the people have every appearance of being well fed; disease is very rare amongst them—no peculiar one was noticed: they reach a Macrobian age almost—men of seventy, stout and healthy, go on fatiguing journeys, and the resident Arabs speak in raptures of the genial climate and the abundance of all things. They certainly bear their age well. In this delightful region all of us felt an elasticity of spirits, which will not soon be forgotten. The fatigue of returning to the ship, though encountered in the day from motives of prudence, was not attended with any injurious effect, except a few colds from drinking quantities of water when hot and perspiring. The Europeans again, on returning, endured fatigue better than the sepoys. On approaching Mukutshu, we found our guides and guard were anxious, as I had insisted on returning by the shortest route, though it led through the territory of the hostile half of that town. We met several men of the opposite party, but we were too strong for them to do more than growl at us. On coming to wells, the people, being of the adverse party, carried away all the draw-buckets and ropes, and gesticulated violently, forbidding our approach; but thirst was a rather more powerful motive than the anger of a weaker party was a restraint, and we took possession, to their annoyance, of the jars they had been employed in filling for their households; seeing this they brought back the draw buckets. These people are very susceptible of improvement; the chief interested himself to learn the mode of using the percussion pistols the very day he received them, whereas the Beloochee killedar of Mombas declined accepting the same pistols from their novelty.

Punishments are inflicted according to Mussulman law; compensation is generally received even for murder by the relatives of the dead, but when refused, an extraordinary mode of strangling is sometimes practised; at others, the spear or knife does the business. The strangling,

as I am credibly informed, is thus effected :—Relations of the deceased claim revenge from the elders of the community, the elders repair with the nearest relations and sit down at the murderer's door, who is solemnly reminded that blood is legally demanded for blood. He requests time to pay his devotions, and then sits inside his dwelling and cries he is ready. The relations of the deceased enter the house and close the door ; having prepared a lever of wood and a rope, the latter is passed under the jaw, brought over the ears to the crown of the head, and fastened to the lever, which is used as a wrench to break the unfortunate man's neck. It is described as a horribly slow mangling method.

The only thefts we experienced were the loss of a silver fork, and buttons from our uniforms, which were supposed to be gold.

We heard of a highway robbery which took place when war existed between the two towns. An Arab merchant was the victim, who lost his property and his life by rashness. It is singular that the murderer of this man was at Merka the day I proceeded to the river, and was violent and threatening in his language, even saying, "if that Feringi has been to the river I will kill him," &c. : this, one of the Barawa guides heard. The bystanders tauntingly told him the Feringi was surrounded by the Salatin or Sheiks, whom he must first deal with. His vapouring was subdued a little by this announcement.

The chief of Shingain, the northern half of Mukutshu, named Imaum Ahmed Imaum, I fear, may throw difficulties in the way of others wishing to traffic in, or visit, the interior from that port, as he expected large presents from me ; but, as gifts were not necessary, I made him a suitable acknowledgment, which, however, he was dissatisfied with, I heard, expecting more ; he is entirely under the interior chief's authority, however, and so need not be propitiated. I sent to the rebel a very civil written message of amity and good will, in return to a letter he addressed me, urging an interview. I did not go over to visit him, as it would be recognising two chiefs to a small town, and probably aid in establishing his authority in opposition to his uncle, which I had no reason to countenance, as his uncle had done all I desired of him. At Mukutshu, called Hanir by the Somalis, I fully ascertained that the natives of the neighbourhood where the buggalow was wrecked had not been guilty of plundering, or any outrage on the occasion, and that what property was saved had already gone on to Zanzibar, which is all that could be expected. Leaving Mukutshu, after a stay of eight days, on the 17th, having taken in firewood, which is abundant, cheap, and good on all this coast, I proceeded direct to Haffoon, from whence my report will detail my proceedings.

In recapitulation, I may observe, that the first positive knowledge I gained of the Haines River was from a native of Zanzibar. I tendered him fifty German crowns, on my own account, to be my guide to its banks. The man remained on board about a week, and then ab-

sconded, supposing, I imagined, that my offer was insincere. I found the detail of his verbal communication to be wholly incorrect, excepting the fact of the existence of the river.

I have succeeded in tracing this fertilising stream for 110 miles of direct distance, have established a friendly intercourse with the great Somali sheik resident on its banks, (the extent of whose authority the map will show,) and I trust that the effect of this vessel's visit to those hitherto unfrequented parts will be to render British property secure, and her subjects respected, under any circumstances. It may, with confidence, be remarked also, that the Jub is open to English enterprise; the friendly chiefs of Barawa invited me to enter that river in the most friendly manner, offering their services in any way. The effect of my visiting the interior under the auspices of the principal chiefs, must be favourable to future intercourse. I had many secret offers, which, had I been at liberty to avail myself of, would, I cannot doubt, have ensured my safety to the borders of Abyssinia from the equator. I may remark that, had I lent a willing ear to all the reports of ferocity and bloody intentions of individuals and parties among the people, I should not have gained any positive information at all; but it is a presumption well founded, that the natives of that coast have much greater dread of a European than he entertains for them. To show their sense of his superiority, they not only style him "Kabail," but "Koreish," (of a most honourable tribe,) and are, one and all, well aware that we are a people of "the books," or holy writings, and not Kafirs altogether.

At Gulwen alone, was hostility shown: they are a community of runaway slaves of very republican manners, acknowledging no authority, but are remarkably self-willed cruel masters. The spot they have selected as a settlement is exceedingly eligible. Among other alarms spread by the mischief-makers amongst them, was, that the English wanted to connect the river with the sea; and many of the natives' inquiries and remarks evinced a high respect for the superior intelligence of the Europeans. It is said that the banks of the river at this site are much higher than the land of the vicinity, which gives force to the representation that we could connect the river with the sea.

Whatever authority the Arabs once possessed, they have long become merchants only of the districts they inhabit. They do not join in the wars of their Somali fellow-townsmen, and exert no authority but that of the influence of their name and character as shereeffs: every Arab, young and old, poor and rich, receives the designation of shereeff from the credulous and ignorant Somali community—they are also the wealthy of the land.

General Remarks.—The soil of the tract comprised in the map is of the richest red clay, with a little sand on the surface near the sea. Not a stone the size of an egg was met with, except the coral of the coast, though authentic accounts of hills, sixty or eighty miles in the interior, was received and noted in the map. The soil produces plentifully

maize and millet, according to the quantity of culture; as also a kind of bean, small and very palatable; also the cocoa-nut, plantain, water-mellon, and pomegranate. Lime and wild figs were met with, and there is no doubt that all the tropical luxuries would abound in a very short period if once introduced. The almost incredible quantity of 1300 lbs. of winnowed grain can be purchased for one dollar on the banks of the river.

The tame animals are—the oxen with humps, camels, black-headed sheep, (with large tails,) goats, donkeys, dogs, and cats; the wild—the elephant, camel-leopard, rhinoceros, lion, leopard, buffalo, zebra, ostrich, porcupine, river-horse, alligator, many varieties of antelope, two species of monkey, and the civet cat; the latter is occasionally kept in confinement, and its musk removed by scraping once a-week. I saw a very large and savage one; it was barred like the wild cat of Europe, and quite as large. The birds noticed were the ibis, golden or cape goose, the quail, the gigantic crane, the common stork, the heron, smaller cranes of a slate and white colour, two species of divers, the bare-necked vulture, a brown hawk, and birds of every hue: a kind of yellow sparrow was exceedingly common. There are very few venomous snakes, but a great variety of the larger class: the boa constrictor, I think, from the description I heard, are common and very large. The occupations of the inhabitants may be shortly dispensed with. The women are the spinners of cotton, wood and water-fetchers, and cooks: the men weave, go journeys, and cultivate the ground; although slave women assist in cultivating also, if not taught to spin. All their domestic utensils and cookery appear derived from India, excepting stewed coffee, which is, I think, Somali all over.

From the best information I could obtain, the population of the kingdom of Mukutshu, settled on the banks of the Haines and Jub rivers, amounts to 150,000 persons. The Bon and Fibu tribes, who are the bushmen of these parts, with their small arrows and gross habits of feeding, (for besides the flesh of the elephant, camel-leopard, and rhinoceros and river-horse, they are said to eat the lion!) reach 10,000 persons. The pastoral tracts are described to be inhabited by a countless multitude; or the people are like the sea for multitude, as the Arabs say. The country is wholly unknown from Mukutshu to Haffoon, a distance of 600 miles. There is no record of any European having visited the shore for the purpose of inquiry. Taking this line, and the reported extent of the Mohammedan population of Somalis in the interior to the country of the Gallas, the amount of land may be estimated at 151,000 square miles. Native statements raise the population to a million, but allow it 250,000, which is a very low estimate. The internal traffic is by camels: they have been supplied immemorially with Indian and Kutch goods through Arab and native Indian traders. The facility of Aden as a mart is again being felt in the increasing activity throughout the northern districts, to produce for that market the staple commodities of the land—hides, gum, &c., cattle, sheep, &c.

When the survey I am ordered on is completed, I hope to be able to give, with some accuracy, in a tabular form, the result of my inquiries and observations on the portions of the African continent immediately opposite Aden.

In passing up the coast to Haffoon, I satisfactorily ascertained, from an old Mahei pilot, that the coast from Mukutshu to Haffoon was seldom visited, except for water: no harbour is known, or mart established. An extensive nulla or wadi discharges a large quantity of water into the sea 30 min. to 40 min. northward of Ras-al-Khyle in the rainy season, (July and August,) but water is only found in large pools during the other months, extending, however, for about 20 days' journey, or about 240 miles, and supporting a pastoral population, whose chief, Hadji Ali, has a force of 1500 horsemen armed with spears and swords. The designation of this extensive valley is "Wady Nugal" وادى نوگال. Two natives whom I took on board as witnesses to determine the dispute about the buggalow wrecked at Haffoon, gave me minute information of various rocks, and the produce of the divisions of the country in the neighbourhood, their sheiks' power and influence, but hardly complete enough to enable me to submit it as worthy of dependence. At Bunder Gasim I met with an intelligent young man, who had lately made a pilgrimage and commercial tour, including a visit to Harrar or Adhari, which involved some particulars of interest. I give it nearly in the narrator's words:—

In Ramazan (Oct.) I took twenty-five bohar of gum arabic, (of fifteen frazilas each,) and three balalis (or jars) of ghee, and embarked in an Arab buggalow to proceed on a pilgrimage. We reached Jidda in nine days. The gum realised 212½ dollars; the ghee, 30 dollars. Performing the pilgrimage, and purchasing Kutch cloths, I re-embarked. The nacodah put in at Snakier, wanting "rezi" or millet for his crew. From Snakier we went to Zela, the wind not allowing us to come on to Barbarra. From Zela I hired five camels, and joined a kafila to proceed by land. We reached Adhari or Harrar in seven days. At the first day we came to a river, and for six days drank its water: it was on our right hand. On reaching Adhari we found the fountains of the river. I saw them—the water comes out of the ground with noise. The river is said to be five fathoms deep, and is as broad as this ship is long, (100 feet.) The chief of Harrar or Adhari (Harrar being the name of the country which extends within two days of Habesh) is named Imir Mohammed, and is a very just man. The town of Adhari is very extensive, with a wall all round, and four gates. It would tire a man to walk round it in one or even two days. It is twice as large as Jidda, but there are not so many houses or people. Coffee is grown within its walls. The governor and his soldiers are very much afraid of the Gallas, who live in the immediate neighbourhood of Adhari. When a Galla kafila comes, three or four men only are admitted into the town, leaving their arms at the gate. Adhari

has luban (bedurni) or frankincense of the hills, in distinction to Jawa frankincense which is reputed better, coffee, wars or saffron, habush (captives of war,) ghee, hides, ostrich feathers, myrrh, gum arabic, and millets. The Gallas come there every day, but never go to Zela from fear. I remained at Adhari four or five days, and came on with a kafila to Barbarra, from whence by sea to this port, "Bunder Gasim." I was twelve days from Adhari to Barbarra, and brought down coffee, hides, and habushi: the habushi are custain, (Christians.) To buy and sell a Mussulman is haram, (forbidden.) My father gave them as an honour to the Nakib of Maculla, who returned 105 German crowns, or 180. I said, "have you spoken the truth?" By God, falsehood is haram, (forbidden.)

At Adhari they have a strong fort on a hill within the town walls. From this fort the sea is visible. It is only two days' distance in coming to Barbarra. We were close to the sea for many days. All the people of Adhari are soldiers of the Imir. I do not know how many. The Gallas never come to Barbarra, they are afraid to come. The tribes from Zela to Adhari are the Isa and Indubursh. From Adhari to Barbarra, Makahil, Isa, Musa, Abbergajis, and Hebrawal, the country is peaceful: there is no danger except when there is a blood feud. Somalis murder each other, not strangers or people with whom they have no quarrel. You could go to Adhari. I will go with you: the Imir is a just man. Many hundreds of habush come from Adhari every year: they are brought there by the Gallas—cloth, beads, and metals are given in exchange, not money. Such was the traveller's account, which was subsequently confirmed to me, in almost every particular, by two older natives whom I held in conversation for a couple of hours the subsequent day on shore. At Mukutshu I met with a wandering class of men, natives of the neighbourhood of Barbarra, who had visited Adhari, and described it as situated near the sea, at the mountain called in our charts Jible-el-Mis.

I trust Government will find some person of sufficient enterprise, and acquaintance with native manners and languages, to ensure success in penetrating the heart of Africa from the eastward, and in opening up the vicinity of that all-important and influential political position, "Aden."

(Signed) W. CHRISTOPHER,
Lieut., Commanding on Secret Service.

H. C. Brig of War *Tigris*, at Sea, May 8, 1843.

(True Copy.)
(Signed) S. B. HAINES, Captain, I. N.,
Political Agent, Aden.

Narrative of a Hasty Trip to the Frankincense Country.

By G. W. KEMPTHORNE, Esq.

(*Communicated by the Author.*)

BUNDER MAREAH, a small town, the capital of the Mijjarthijee tribe of Somaulis, is situated in lat. about 12 deg. N., and long. 50 deg. 45 min. E., on a low sandy beach on the coast of the Adul, at the bottom of a deep bay twenty miles south-west of Rass Teeluk (or Mons Elephans of the ancients) which forms its eastern extreme, and contains a population about 1500, who live in huts rudely built, chiefly of cadjans or hides, and roofed over with mats or leaves of the date-tree, and scattered over some extent of ground; there are, however, a few stone houses two or three stories high, and terrace roofed,—these belong to the Arab merchants and Banians, who principally reside here for the purpose of annually collecting the frankincense and other gums, which grow abundantly in the immediate vicinity of this spot; the trade usually commences in October, and lasts until January, and is conveyed to the opposite coast in buggalows, from whence it is exported to different parts of India. The country said to produce the best frankincense extends along the limestone range of mountains from Guardafui to Bunder Kassim, occupying a line of coast of about one hundred and fifty miles or more, and stretching some distance inland. Bunder Mareah is also the chief residence of the sultan of this powerful tribe, whose territories reach in a parallel line drawn from Rass Hafoun to the meridian of 47 deg. The country is populous, the interior very fertile, but inhabited by wandering tribes of Bedouins, who possess large flocks and herds. The present sultan is a child of eight or nine years of age, and resides a mile out of the town, which he is not permitted to enter, neither allowed to have any intercourse whatever with the inhabitants, or assume the reins of government until of age. He is now under the guardianship of his paternal uncle, a young man of prepossessing appearance, who manages the affairs during the minority of his nephew: the title is hereditary, and although the power is despotic, yet the whole tribe pay the greatest respect to their chief. The natives being Mohammedans, are guided in the administration of justice by the laws as laid down in the Koran. They are all, however, greatly bigotted to their religion, but we found them particularly civil and friendly, doing all they could to render our visit to them pleasant, never offering to molest or insult us in any way. They brought us sheep and bullocks as often as we required them, and they promised to obtain any number if the vessels would only remain a few days longer, as they had to send for the cattle some distance inland, where they were then grazing, which would cause a delay of a few days only. Fresh water can be procured in great plenty from wells at the distance of two miles to the south-east of the town, and a ship might fill up in the space of a day; it can also be obtained in many places along this coast, by digging a few feet in

the loose gravelly soil a hundred yards or so from the sea-beach; the only difficulty would be in getting it off, as there is generally a heavy surf running, especially during the height of the south-west monsoon. This part of Africa is destitute of harbours, but the anchorage is not bad during the fine weather, and vessels of large burden can lie close to the shore in four or five fathoms water. There are many towns and villages visible from this place, nearly all of them having several stone-built houses, seen some distance at sea, little known, however, or frequented by Europeans, but where a great deal of traffic is carried on by the Arabs and Banians, who export gums of all kinds, skins, raw hides, sharks' fins, &c., which the natives exchange for coarse kinds of cotton cloth of Surat or Guzerat manufacture, and an inferior quality of rice from the Malabar coast, &c. The land is of a barren sterile aspect, destitute of vegetation, and rising almost abruptly from the sea to the height of about three or four thousand feet, very rugged, irregular, and broken into numberless peaks, with nothing green to relieve the monotony of the scene save a few scattered bushes of the tamarind and acacia tribe, and a small jungle of mangroves, growing along the banks of a creek to the eastward of the town.

The natives having informed us that the frankincense country was so near, a party determined to visit it, being curious to see the tree that produced this valuable gum. Everything having been arranged for our trip, and accompanied by a strong party of Somaulis, "armed with spear and shield," (who were to act as our guides and protectors,) started from the town in the cool of evening on the 6th of September last, and rested for the night in a ravine near the wells.

On the following morning early, commenced our ascent up the mountains by a circuitous pathway, and after scrambling over huge rocks and stones, now and then climbing up their smooth surfaces, we at last came to a more level road, and proceeding through a narrow pass, entered rather suddenly upon a plain about a thousand feet above the level of the ocean, where we saw growing the gum acacia, a species of aloe, and a variety of other small shrubs, and bounded on all sides by precipitous hills; the sides and tops of these, even to their summits, were covered with a forest of trees, extending everywhere as far as the eye could reach; but presenting a very sombre appearance, few of them being in foliage, and the ground, from the want of soil, being perfectly destitute of all underwood or grass. Continuing our journey up the face of this almost perpendicular range, and having reached a small piece of tableland at an elevation of nearly 2000 feet, rested to admire the extensive view before us. Hills rising on hills, in endless confusion, were seen on either hand stretching far away in the distance, whilst the town, the plain, and the vessels at anchor in the bay, seemed like mere specks at our feet. We remained some time gazing on this prospect, and then proceeded to examine the frankincense trees, near which were certainly the most extraordinary productions of the vegetable world I ever witnessed, and would require an abler pen than

mine to give an adequate description of them. On a close inspection we perceived, to our astonishment, that they grew from the bare and almost polished sides of the lime-stone rocks, without in any way receiving nourishment from the soil, (of which these mountains are perfectly denuded :) if there had been any even, there was not a crack or crevice perceptible where the roots* could find their way down. The largest appeared to be about forty feet in height, gradually decreasing upwards; the stem round about, two feet in circumference, and rising straight up, having a bend outwards of six or seven inches. They are attached most firmly to the rocks, by a thick oval mass of substance, tapering away towards the edges, nearly treble the diameter of the trunk, and of a nature between bark and wood, resembling a mixture of lime and mortar. Branches spring out rather scantily from the top, and extend a few feet only down the stem. The largest are about four feet long, with leaves on each side, rather widely apart, five inches long by one and a half, narrow and rounded at the point: the upper surface is of a rich dark green, while the lower is of a lighter hue, thin and smooth to the feel, and plaited or furrowed, not dissimilar to that peculiarly beautiful sea-weed so often found on the coast of England. It has four layers of bark or skins, the outer being very loose like that of the beach, while the two next are delicately fine and greatly resembling oiled paper, or goldbeater's skin, of a bright amber colour, and perfectly transparent, which can be taken off very easily in large sheets: the natives find it very useful for writing on. The inner bark of all is nearly an inch in thickness, adhering closely to the stem, tough, and striped red and white, yielding a strong resinous perfume. The timber is white, soft and porous, and would be of little use for any purpose. A deep incision into the tree causes the gum to exude in great abundance, which is of an opaque milky white, which hardens and becomes partly transparent by exposure to the atmosphere. The youngest trees apparently produce the best olibanum,† whilst the older yield a clearer fluid like varnish.

It is a remarkable fact, that not a frankincense tree was seen growing upon any other rock but that of limestone, (the purer it was, the finer the tree,) and it clung so tenaciously to it that no force of ours could detach one from its cold companion. The nature of the plant likewise seemed to be such, that my belief is it could not live if transplanted to the earth, as it would perish perhaps for the lack of that peculiar nourishment which must have been obtained, in some unaccountable way, from these marble cliffs: it is not improbable that it receives its support from the pure carbonate of lime; but this, however, is a mere conjecture of mine, and I must fain leave it to those who are more versed, both in chemistry and botany, to solve this curious problem—it is one well worthy the attention of the scien-

* The roots, it is supposed, must be deeply imbedded in the rocks, though the crevices were hidden from our sight by the substance above described.

† Called by the natives Luban.

tific world. I regret that my visit was so short as to render it impossible to make such observations on the growth of this singular plant as I could wish, but this account, imperfect as it is, may, in a measure, serve to throw some light on a tree which has never before been described. It was also unfortunate that none were in flower, and but few in foliage, so that neither specimens of seeds nor flowers were procurable: the leaves that were obtained, in consequence of their being badly preserved, crumbled to pieces. No very distinct or accurate opinion as to the geological structure of the mountains could be formed, but sufficient was seen, whilst on the coast, to convince us that the whole range * from Cape Guardafui was purely a limestone formation, with veins of white and rose-coloured marble running through them—immense blocks, twenty or thirty feet high, of several hundred tons weight, were seen lying on the plain, at the base of the hills, evidently having rolled down from the highest precipices.

It may not be out of place were I to make some remarks concerning Bruce's assertion, that the "odoriferous forests of this country, which were known to Herodotus, were in danger of fast disappearing;" but there never could have been any grounds for such apprehension, as the trees are to this day so numerous, and extend over such a vast tract of land, that many centuries must elapse ere they can become wholly extinct. The kingdom of Adel, even in the earliest ages, carried on the traffic of gum, frankincense, and myrrh, and supplied annually the fleets of Solomon the Great with these precious commodities; and this ancient trade continues the same to the present day with no apparent alteration. The Greek and Roman writers also testify that it was not improbable the forests and groves overspreading the interior of Adel and Ajan, produce medicinal gums, odoriferous resins, and aromatic barks, and I feel assured from what we could glean from the natives themselves, this account is correct, as they informed us the country immediately beyond these mountains was clothed with wood and verdure, abounding in plains of grass, where immense flocks and herds (both wild and tame) feed on their almost boundless extent; large streams of water also take their rise at the back of this range, and, running a course to the southward, empty themselves into some of those great rivers which find an outlet in the Indian Ocean to the northward of the equator. This portion of north-eastern Africa, hitherto entirely unexplored by Europeans, would afford to the botanist a wide field for discovery and research, and doubtless would yield him a choice and abundant harvest. I do not conceive there would be any difficulty whatever in penetrating the country if accompanied only by a few of the Somaulis inhabiting this coast, who seem friendly disposed towards us, and whose presence would alone be a sufficient guarantee for the safety of any traveller. It is to be hoped, moreover, that our possession of Aden will, in a few years hence, work a moral influence

* This range runs nearly due east and west, from Guardafui to the Bay of Tajora.

over this half civilised race, and make them become useful members of society. Their frequent intercourse of late with us has no doubt already taught them not only to respect our name, but also to dread our power. Having accomplished the object we had in view, returned to the town at sunset quite pleased and delighted with our day's excursion, only regretting that our stay at the Port was of so limited a duration as to render it impossible to prolong our visit to the Frankincense country to a further period.

A Memoir on the Country between Bagdad and the Hamreed Hills. Drawn up by Lieutenant H. W. GROUNDS, of the Indian Navy. Dated Bukhoba, Wednesday, the 28th August, 1839.

(*Presented by Government.*)

Bukhoba, Wednesday, August 28, 1839.—Having received my instructions from Captain Lynch, I left the steamer yesterday evening with Ellis, one of the quarter-masters of that vessel, taking what little kit and provisions was actually necessary for the trip, with two sextants, a telescope, a false horizon, a semolcolder compass, and a good pocket watch. We left a little before sunset, and pulled down to the lower bastion, where our guide (Seyd Hindee) was in readiness with our cattle. Loaded the mules, and at a quarter past seven left the banks of the Tigris. Besides my own pony, I had hired a horse and three mules: myself, Ellis, and Seyd Hindee, with my servant and the muleteer, composing the party.

Rode along about N.E. over a level country, covered with high grass from the late inundation; the regular road a little to the northward of my track being still under water. Going very slow to allow the mules to keep up, which do not promise well for the future.

At 8.40 passed the remains of an ancient canal, which the darkness of the night prevented my tracing, though as far as I could discern running about S.S.W. 8.45 to 9.15.—Passing extensive mounds of ruins close on our left, with the dry bed of a canal running from about north, passing the north-eastern extreme of the ruins, then running S.S.W. in the direction of Gerohra: quantities of brick and tile scattered about the surface.

Leaving these ruins, we rode on about N.N.E. over a level plain scattered over with the camel-thorn and caper bush. The moon had now risen, and we were able to see about us a little better. At 10.40 came to the Kudthrie canal, running south-west from this, and coming down from the N.N.E., riding along it on its left or eastern bank. About twenty minutes past midnight found ourselves too far to the eastward close down upon the Dialah, turned off to the N.W., leaving the Kudthrie to our right. Another large canal half a mile on our left,

running nown from about north : rode along it, and at twenty minutes past one this morning arrived at the Khan beni Sad—the canal passing close by it. Halted here till daylight. At 4.30 sent the mules on, stopping myself to obtain angles at sunrise. At 6.40 left the khan, having been detained some time in getting the angles with the pocket sextant, which has lost a good deal of the quicksilver off its glasses, reflecting the objects very badly. Khan Jedudah, with several villages on the Tigris, distinctly visibly from this with a telescope; but having already lost two hours in fruitless attempts with the sextant, and the sun getting warm, I was obliged to leave without getting angles to them. The village near the Khan is now in ruins and deserted, with the exception of one or two old men from the banks of the Dialah. No supplies of any kind to be got.

After leaving the Khan, rode along the bed of the canal mentioned before in a N.N.Ey. direction. It is said to be a branch from the Naher Wan. At 8.30 it turned off to the N.N.W. at a place where there are a few mounds of ruins called Karai Biswaind. Leaving the canal on my left, I kept to the road going from N.N.E. to N.

9.12.—Passed the dry bed of the Naher Gartool, another branch from the Naher Wan. This appears to have been a noble canal about fifty yards across, its banks high and perfect, running N. by W. and S. by E.

9.40.—Crossed the Naher Wan, whose high and rugged banks extend as far as the eye can see to the north-by-west. Below they are cut up a good deal by the Dialah, lying in misshapen heaps. The breadth of the Naher Wan here must be upwards of one hundred yards; had it not been so hot I would have stopped to measure it, which I hope to have the opportunity of doing by and by. The Naher Gartool runs parallel with, and about a mile to the westward of it. At 10.5 arrived at the Khan-el-Hadjun, where I found the mules had crossed the Dialah to Bukhoba: rode down to the river, and at 11.8 crossed it at the Howedah ferry, after some delay, occasioned by the rope to which the ferry boat was attached giving way. It was near noon before I got out of the sun, which was burning hot, having little or no wind. Took up my quarters at an old khan in the centre of the town, which is dirty and hot. I must look out for something better, as I intend stopping here for a day or two to examine the Naher Wan, as well as some of the points of our old survey. Therm. at noon 97 deg., and at 3 P.M. 93 deg.; wind light from the S.E.

Thursday, August 29.—No better quarters to be had. Rode out this morning for about two miles to the northward. The country cut up with canals and water-courses. Stopped near the village of Khernabat, and obtained some bearings from a mound on the banks of the Khorasan canal, which supplies a considerable body of water to the villages about here, winding in every direction, and throwing off several branches to the southward and eastward. The country about here is so cut up, lying in confused heaps, that I should have taken it

for the ruins of a town had there been any bricks, of which, however, there were no signs, with the exception of a mound on the canal, about a mile from Bukhoba, where there are a few; it appears to be the remains of a bridge that has been built over it, similar to two or three that are still perfect in the town.

I stopped at the bend of the Khorasan with the centre of Bukhoba bearing S. by W. by compass, distant about two miles. The villages of Aboo Taydeh on the Dialah, and Dultowah on the Khalis, in sight. The Khorasan, after leaving Aboo Taydeh, passes through the two villages to the southward of it, winding close round Kheruchot and Howedah, to the eastward through Bukhoba and Bohreeze to the tomb Abo Khomis, about six miles to the southward, shortly after leaving which it is choked up, having formerly ran as far as Crisiphon. Villages scattered about in every direction, watered by branches from this and the Mahrool canals. At 8 I returned to the khan. The weather very warm during the day, without a breath of wind. Thermometer at 3 P.M. 98 deg.

Wujarieh, Friday, August 30.—The sand-flies and musquitoes very troublesome during the night, with the additional annoyance of some large scorpions and centipedes, having killed two scorpions in my bed.

Awake at a quarter past three this morning—loaded the mules, and got away at a quarter past four. Road lying E. by N. for the first hour, then N.E. by E. Passed three villages on our left on a branch of the Khorasan. At 5.50, met Sheikh Shummah with a party of horsemen on their way to Bukhoba.

At six passed a branch of the Khorasan running south. A mound of ruins, about 100 yards long, a short distance on our right.*

At 6.40 came to some extensive mounds of ruins, called Kharaster, forming an irregular oblong half a mile north and south, and two-thirds of a mile east and west. Quantities of brick and tile scattered about the surface, with one or two massive heaps of masonry, like fallen walls, now nearly covered with dust. The Arabs told me there was a well of good water in these ruins, which, however, I did not fall in with. The Beni Thomeen Arabs cultivating between these ruins and Shuban. At 6.55 left the ruins, and 7.25 passed the Mahrool canal over a bridge of one arch; direction of the canal N.N.E. and S.S.W. The ruined village of El Ugga on its banks near the bridge.

Moola Ally has lately been making very heavy demands on the villages about here for money, which is the cause of this and several others being deserted. The dates are now nearly ripe, in large quantities, without any one apparently to pluck them. I hear Moola Ally has just taken himself off to join the Pacha, who is now at Kirkook on his return to Bagdad.

"Walla ullah ruhum," as they say here. 8.10, Passed the village of Sinsajee on the Mahrool, also lately deserted. At nine arrived at the

* Probably the one mentioned by Mr Rich as Lissea. At present the people about here have no name for it.

village of Wujarieh, one of the largest about here, with beautiful gardens of orange trees, now labouring under the weight of their fruit, which is now three or four months from being ripe. The sun getting warm, I stopped here, taking up my quarters at the Moolah's house, which is a little cleaner than my last lodging at Bukhoba.

I have been much amused all day by the curiosity of the natives, who are not a little astonished at our English manufacture of pistols, &c. The percussion-caps I have has excited their curiosity more than anything, saying, "It was truly the devil's work, and not the work of a man."

The sextant and compass, and lastly a lead pencil, amused them a good deal. I am now just getting rid of them, after having seen every man, woman, and child of the village. An unfortunate woman labouring under severe rheumatism, has been bothering me for the last hour to cure her; nor can I make her or the rest of them believe that I am not a "Hakim."

The Mahrool canal, which passes through the village, comes down from about north,—winding here to the south-east and east, to the villages of Bugunea and Hamranea, four or five miles off; it then runs down to the southward again.

Shuban, Saturday, August 31.—Took dinner last evening with Moolah Hachem, who has been very obliging, and shown me every attention. He rode out with me this morning to show us the road to the Zindan, which would have otherwise been very difficult to find amongst the several small canals about here.

We left Wujarieh at five minutes past five this morning, and rode to the east-north-east, passing several branches of the Mahrool, and at 6.25 arrived at the Zindan, a noble ruin of kiln-burnt bricks, fourteen inches square, and three thick, secured with a very fine cement, similar to the marble cement used in large buildings in England; it is three inches thick between the edges, and two between the surfaces of the bricks, very hard, and shows a polished surface when broken like white marble. I measured the ruin round its base, and found it to be 1612 feet in length, by 124 in breadth. On the north-east side there are sixteen bastions, twelve of which are nearly perfect, from seventeen to twenty feet above the ground; the other four have lost all their facing, but are still discernible. Three pair of loop-holes between each bastion, nearly perfect, about fifteen feet from the ground. On the south-west side there are three niches or port-holes, still nearly perfect, towards the right-hand end. To the left the ruin is not so perfect, having lost all its facing. Both ends of it are crumbled down, leaving nothing to judge by as to their former shape. The top of a small archway remains on the south-western side, close to the ground, with a hollow for several feet under the ruin, where it becomes choked up with dust.

Took a round of angles and bearings, and at 8.5 rode on to a ruin

called the Shug Mirdan, composed of two parallel walls of sun-dried bricks, with broken rugged tops, the highest part of which is about twenty to twenty-five feet. There are no remains of wall to form the other two sides of the square, the ground about being perfectly level. Took a sketch of them, which detained me about ten minutes, and rode on, going north-east by north for a little more than a mile, to the tomb of Sultan Seyd Ali, then about north. From 9.15 to 9.27, passing ruins called Eski Baghdad, a large square wall of sun-dried bricks, enclosing a space of nearly a square mile. The style of building is similar to that of Kudsea or Cardesia, which is much more perfect than this. The only place where I saw any kiln-burnt bricks in this ruin, was in the centre of the eastern wall, where there are the remains of a gateway. The space enclosed appears to be perfectly level, without a sign of any buildings having been there before. I had no time to examine it closely as the sun was getting warm, with a hot wind from the northward. 9.50, and 10, passed two branches of the Shuban canal running south, and at 10.10 arrived here. There are two khans, which, together with the rest of the village, is nearly all in ruins. The Naher Shuban, after leaving the Dialah under the Hamreens, runs to the southward for about six miles, then winds to the westward, passing through Shuban, shortly after leaving which, it again runs away to the east and south-east.

I have taken up my quarters at one of the best houses in the place, which is bad enough, in doing which I have turned out a man, his wife, and five or six children, who, however, are very well contented to remain outside the door, with the expectation of "buksheesh" for the same. Thermometer at 3 P.M. 101 deg., a hot wind blowing from the north-west, which gave me a good scorching between this and the Zindan.

Shuban, Sunday, September 1.—Rode out this morning about two miles to the northward, to a high mount for the purpose of examining it. There is no sign of bricks on it; the earth of which it is composed is black, as if it had been burnt. A large tomb at its foot, called Imaum Abbas, with several graves scattered over it. The village of Sinsil about half a mile to the westward. I had a fine view of the country from the top of it, but had unfortunately broken my spy-glass, which obliged me to return without getting any angles. I have managed, however, to repair it, and intend riding out there again to-morrow. Thermometer at 3 P.M. 98 deg.

Shuban, Monday, September 2.—Thermometer at daylight 72 deg. Rode out again to Tel Abbas; and obtained a round of angles and bearings. The nearest part of the Hamreen is not more than four miles from this, from 150 to 200 feet high. Monsorie village under the hills, bearing by compass 26½ deg. east. The Zindan 5 deg. 20 min. east.

The Mahrool canal, after running down along the hills for about four miles, crosses the country in a west south-west direction, passing about a mile to the southward of Tel Abbas to a village three or four miles

off, 50 min. west from the mound; it then turns down to the southward, running to where I last left it. The Khorasan canal, which runs close to the northward, makes a similar wind to the westward, running down nearly parallel with the Mahrool to Abo Taydeh and Bukhoba. At 7.30 I rode back to the house. Thermometer at three P.M. 98. North-westerly wind and hazy. An encampment of Moolah Ali's party about two miles to the northward of Tel Abbas.

Monsorie, Tuesday, September 3.—At 5.25 mounted and rode to the northward, passing to the eastward of the Khorasan and Mahrool, having the Rooz, Haroonia, and Shuban canals on our right, under the hills.

At 7 arrived at the Dialah under the hills, at the point where all the canals leave it. The river winding in all directions among the hills, after leaving which its general breadth being from thirty to forty yards, though much narrower above, in some places not more than thirty feet. The remains of a bridge projecting out over the river from the sandstone on either side about half a mile above.

Forded the river, which was deeper and more rapid than I expected, having some difficulty in crossing the mules. As it was, they managed to wet all the baggage.

A small canal, called the Naher Shirween, leaves the Dialah on its western bank opposite the Khorasan.

At eight arrived at Monsorie or Adana Kory, a miserable village on the Naher-i-Zenna, a canal issuing from the Dialah amongst the hills about a mile to the eastward.

I have taken up my quarters at a wretched hovel, the best to be got. Houses there are none, or at least very few that have a roof remaining,—the only decent building in the place being a small mosque in the north-east corner of the village. Thermometer at 3 P.M. 97 deg., strong south-easterly breeze and cloudy.

Monsorie, Wednesday, September 4.—Dined last night with Moolah Deife; during the night strong squalls at the south-east, accompanied with clouds of dust with a few drops of rain about 10 o'clock. Rode out at daylight this morning, following the Naher i Zenna; an immense piece of labour, being cut through the solid sandstone, of which the hills about here are composed, for about half a mile from its mouth, where there is a bridge over it of one arch, made of very fine kiln-burnt bricks, nearly equal to those of Babylon. It is said to be very old, although as perfect now as when it was built. On the sides of the arch there are grooves for a flood-gate to run in for the purpose of regulating the supply of water from the Dialah, which would otherwise at its high rise inundate the country: at present nothing but a few pieces of wood remain of the gate. The bridge is twenty-five paces across from the rock to the corner of it near the Dialah, where its wall turns off at right angles along the top of a rocky ridge forming a barrier towards the river, and appears to have formerly been a place of

defence. The remains of another wall two or three hundred yards to the westward amongst the hills. Monsoria bears from the bridge by compass south by four degrees east, distance about half a mile.

A few yards to the south-south-east of this, the sandstone on either side of the Dialah projects over the river, and is said to be the remains of a bridge. I did not see any bricks near it from where I stood above it; but I have little doubt of its having been a bridge, as the narrowness of the river, and the peculiar shape of the rocks, are favourable for such a building. From the hill immediately over it I had a fine view of all the canals which issue from the Dialah about here. The following bearings and distances of the different mouths were taken from where I stood:—

Siddee e Rooz 140, distance 200 yards.

Siddee e Haronia 200, distance 150 yards.

Siddee e Shuban 210, distance 150 yards.

Siddee of the Khorasan and Mahrool, which branch off from one another about three-fourths of a mile to the southward 240, distance 600 yards. Made a station here, and took a round of angles. The Zindan in sight bearing 199¼ deg. From this I rode round a short distance amongst the hills to examine some caves which have been cut into the rocks.

There are six of them, called the Brioot el Gawer, cut into a perpendicular rock about ten feet deep and eight feet broad, with arched tops from six to eight feet high, some of them having a seat cut out of the stone at the inner end with a small recess on either side of the cave.

Some characters, apparently numerals, have been cut out on the sides of the caves, which the old guide says are similar to those at El Hadr. They are not placed in any order, but spread about from the floor to the roof of the caves.

Having copied some of them, and taken a rough sketch of two of these curious apartments, I rode back to the village, the sun getting very hot, and the guide very glad to get clear of the hills again. Two or three people having been murdered near this a short time back, which has spread such terror amongst the villagers, that it was with some difficulty I could get a man to show me the way, and who left us immediately after pointing out where these caves were to be found.

I must return to my station on the hill to-morrow, as objects were not at all distinct from thick haze which lay over the low country.

The Dialah, as far as I could trace it, winds in every direction amongst the hills in short turns. The thermometer at 3 P.M. was 100 deg., calm with occasional light airs at the southward. Latitude by mer. alt. of ☉.

Monsoria, Thursday, Sept. 5.—Rode out again to the top of the hills to obtain angles to any objects that might not have been in sight yesterday from the haze,—took a few additional angles, and returned.

I hear of more cells similar to those I visited yesterday, but can get no one to show me the way, or I would otherwise go as far as Kuzel Rebat, which is only two hours' ride from this, having several interesting ruins on or near the road. Moolah Ali's encampment has moved to the southward towards Bukhoba.

I intend leaving this to-morrow for the purpose of following the Khamlis canals. Thermometer at 3 P.M. 97 deg.; a light breeze from the westward, with hazy weather.

Delli Abbas, Friday, September 6.—Therm. at daylight 72 deg.—Mounted this morning at 7 minutes past 5, and rode towards the Siddirool Kharlis. At 5.27 passed the bend of the Dialah, which is a long wind to the W.N.W., running round three sides of Monsoria. Rode round to the Sidder-ool-Kharlis, with the Shirween canal, and an old cut of the Kharlis, close on our left, and the Naher-i-Zenna, a short distance on the right, crossed the Shirween, and stopped on the Kharlis 150 yards from its mouth W.S.W., when I got the following bearings —my station on the hills 100 deg. 15 min., Seyd Mobarrok—262.00 centre of Monsoria, distant 1½ mile 95 deg. The Kharlis here is about twenty-five feet across, it is deep, and has a large body of water running into it. At 6.15 rode on W.⅓S., at 6.45 Seyd Mobarrok, a tomb near the western extreme of the ruins of Hussania village. After leaving the tomb, rode W.½N. The Shirween and Kharlis canals on our left close to the Naher-i-Zenna, from a ¼ to ½ a mile on our right. At 7.15 arrived at the Khan and bridge of Delli Abbas. Two caravans just leaving, one for Baghdad, the other going towards the hills. Ali Pacha still at Kirkook.

The Kharlis here is about thirty feet broad, with sloping banks, which must make it double the breadth in the high season. The bridge over it has three arches, with two smaller ones for the high rise; it is well built, though now requiring repairs. The Kharlis runs from this nearly straight to the village of Serajik, bearing S. 55 W. about four miles off; shortly after leaving which, it branches off into two large streams—the one called the Naher Toweileh, which runs to the southward, taking most of the water from the main trunk, and waters all the villages towards Kauthun, and to the southward of Dultowah. The other, which retains the name of Kharlis, runs through Dultowah to Sindra, throwing off several branches, watering all the villages in the northern part of the district. Got a round of angles from the top of the khan, latitude by the sun's merid. alt. 34 deg. 04 min. 59 sec.; therm. at 3 P.M. 98 deg. Intelligence arrived of Ali Pacha being on the move again towards Baghdad, and is expected to be here the day after to-morrow. He was at Kifri when the messengers left.

Saturday, September 7.—Amused all night with something little short of an Irish wake, which commenced by a woman tearing her hair, beating her breasts, and yelling as loud as possible, invoking the departed spirit of her brother, who had just been killed outside amongst

the Arabs. In the course of an hour she was joined by half-a-dozen more, which kept us awake half the night, until they were tired themselves, their mournful chant dying away to an occasional short cry of grief, till about midnight, when all was quiet. We were not allowed to enjoy our sleep long; for a noise commenced occasioned by some people belonging to a passing caravan robbing some of the people outside of their cattle.

Left the khan this morning at twelve minutes past 5, and rode to the S.S.W., passing Serajik about four miles on our right at 7. Stopped at a large mound of ruin similar to Tel Abbas. Made a station on it, and took angles. The Zindan in sight—bearing 135 deg. The bridge of Chilook, 3 miles to the W.S.W.; at 8 went on; at 8.45 passed the bridge and ruined village of Chilook, and rode to the west, over a country covered with the camel-thorn and caper-bush. Going very slow over bad ground with a beaten track; at 9.15 at a branch of the Kharlis running south-west from near Serajik. Rode along it, and at 9.30 crossed it to some Arab huts, where we took up our quarters for the day, no villages being near: got a breakfast of ghee, honey, and slapjacks.

An amusing old chap arrived here shortly after me, who is apparently a Georgian employed by the Pacha on the revenue duty. A hot wind from the N.W. during the day, blowing strong at times; therm. at 3 P.M. 108 deg. This afternoon I rode back to Chilook, and obtained angles and amplitude: the Hamreen hills no longer in sight. This being a fixed point of our former survey, I was in hopes of being able to fix the Zindan from it, but found it was shut out of view by the intervening groves of Zerath and Abo Taydeh.

Dultowah, Sunday, September 8.—Enjoyed a splendid meal of a lamb roasted whole; the old Georgian amusing us all the time with his conversation. The sand-flies very troublesome during the night, not giving one a moment's rest.

Left the huts at twenty minutes past 5 this morning, and rode to the west, over ground cut up with old branches of the Kharlis, and covered with wild vegetation. At 5.48 passed a branch of the Toweileh running south, and at 6 stopped to take angles at a tomb near a date-store called Ambugea, this being also a fixed point of our former survey. The stumps of a grove are still remaining here, having been cut down by Ali Pacha,—why, or wherefore, I know not, unless it is to make bridges over the canals about here. At 7.10, rode on. At 8.15, crossed a branch of the Toweileh running S.S.W.

At 8.45, on the Naher Toweileh, a fine canal about twenty feet broad and very deep. Crossed it by a fort-bridge, and rode along its right bank winding from S. to W.S.W.

At 10.5, at the bend of the trunk stream of the Kharlis, which takes a wind here, approaching within fifty yards of the Toweileh; the Naher Wan comes down here also from the N.N.W., making a perfect con-

fusion of high banks and mounds, the one running across the other. At 10.30, arrived at Dultowah, and took up my quarters at the khan, which has lately been repaired, clean, and altogether the best lodgings I have had since leaving Baghdad. Very few people coming in and out of it.

Dultowah, Monday, September 9.—I was not allowed to enjoy my comfortable quarters at the khan long; old Seyd Hindee came to me in the afternoon, saying he had seen a splendid house, and appeared to be very anxious for me to go and look at it. He led me to the house in which I am now lodging, where I found the owner of it, an old gentleman I had met with before in Baghdad, and who would not hear of my going back to the khan, but putting the chebouk in my hands, and bringing out a bottle of arrack which he said he had made seven years before, he told me to make myself comfortable, and sent for the baggage from the khan. This may be all very good on his part, but I should prefer my former quarters, as his house stinks so abominably of the above-mentioned liquor, that it has given me a headache.

Rode out this morning for the purpose of tracing the Naher Wan to where it is cut away by the Tigris to the northward, but after an hour and a half's ride, came to it a short distance from where it is cut away by the Dughara lake; and finding I should have to take a long round before I could come upon it again, I stopped here, and got the following bearings: direction of the Naher Wan, above 315½ deg.; below, 136. *Village of Jezanee on Kharlis, dist.* 2 *miles*, 240 deg. to 251½ deg. Sindia vill., dist. 3½ miles, 253 deg. to 258 deg. Dultowah, dist. 4 miles, 181 to 157 deg. The breadth of the Naher Wan 105 large paces, or about ninety-six yards.

On my road back, stopped at the Khan Naher Wan to examine another canal running parallel with, and about three quarters of a mile to the westward of, the Naher Wan. The bed of it lies much lower than the Naher Wan, and considerably lower than the level of the country. It is ninety-seven long paces across the bed of it, and must formerly have been a noble canal. This must be the continuation of the Naher Gartool which I met with near Bukhoba, direction of it 312 and 135 deg. Rode back to the house; thermometer at 3 P.M. to-day 97 deg. Dultowah at present is the most flourishing village of the district, its date-trees apparently bearing larger quantities of fruit than those of any of the other villages. The gardens are well watered, hundreds of little watercourses running in all directions. I intend leaving this to-morrow morning to trace the Naher Wan to where it crosses the Dialah near Bohruze.

Khan el Hadjim, near Bukhoba, Tuesday, September 10.—Left Dultowah this morning at 5.20; at 5.40 crossed the Naher Gartool, and at 5.45 crossed the Kharlis and Toweileh, and rode along the bed of the Nahuldars. At 6.15 on the Naher Wan, Dultowah W.N.W. 2½ miles, direction of the canal 139 deg., and shortly after winding

more to the southward. At 6.40 passed a village on the Toweileh half a mile to our right; at 7.40 large extent of ruins on the banks of the Naher Wan, comprised of low mounds covered with tiles, a few bricks here and there. Shortly after leaving these ruins, came upon the Dialah, near Howediah, which here cuts away one bank of the Naher Wan for nearly a mile; at 8.20 arrived at the khan, just in time to get the best place, as men and cattle have been arriving all day belonging to a caravan from Teheran—the khan being now completely full, with not less than eight or ten hundred people, besides mules and horses. Moolah Ali's men in Bukhoba.

These Persian pilgrims are the most impudent set of rascals I ever met with—they would ask you to give them the coat off your back, the women being the most troublesome. After giving a woman who appeared to be nearly starving, something to eat and drink, and who was walking away after having made a better meal than she had made, or was likely to make, for some time, she suddenly came back again requesting me for some of the mutton chop which had just been brought in for my own breakfast. A man also, who I had ordered the servant to give some bread to, came back and asked me for a smoke, so that I very soon found out that the horse whip was the most necessary article for them, and which I am obliged to use now and then to keep them at a proper distance. Thermometer 101 deg. at 3 o'clock.

Khan el Hadjim, Wednesday, Sept. 11.—Rode out last night to the bank of the Naher Wan, over the Dialah, to obtain a round of angles, and enjoyed a bathe in the river after my confinement in the khan during the day.

The sand-flies very troublesome during the night.

Left the khan at five this morning, and rode down to where the Naher Wan crosses the Dialah. Below Bohruze, I find the Naher Gartool or Kartool to be the same canal that I met with above Sindia: it still continues parallel with the Naher Wan, running down on the right bank of the Dialah as far as I could see. The breadth of the Naher Wan here is 142 yards: it continues on the other side of the Dialah, in the direction of 175 deg., its banks being a good deal cut up by that river; direction of it above 346 deg. Took a round of angles, and at nine returned to the khan: during the day the caravan on the move for Baghdad, and we are now nearly clear of them. Light north-west breeze. Therm. at 3 P.M. 100 deg.

Khan Jideedah, Thursday, September 12.—Rode out again yesterday evening to the Naher Wan to make some further observations. Took another swim in the Dialah, which I found to be actually necessary, after getting rid of our late companions, as it is hard to say whether the lice or sand-flies were the most numerous during their stay.

As Moolah Ali's men are going to occupy the khan to-day, and hearing that the Pacha will be down here with the army to-morrow or the next day, I think it advisable to return to Baghdad. I have taken

this road in preference to the one by Khan Beni Sad as it brings me on the Kharlis again, which it is my object to fix in as many places as possible.

We left the Khan el Hadjim at ten minutes past three this morning, and at 3.30 and 3.40 passed the Naher Wan and the Gartool canals; passing several branches of the Toweileh as at foot.* Riding from three-and-a-half to four miles an hour W. by S. at 5.37, passed a mound of ruin, called Mujelibi, about 100 feet square, apparently the remains of a fort, and said to have been built by the Persians when trying to take Baghdad.

Some small mounds, about a quarter of a mile to the N.E., near the village of † , on a branch of the Kharlis; 5.45 went on. From 6.37 to 5.47 passing the grove of Dokhala on the Tigris.

6.48 to 7 passing Hawesh, going south-west 7.15 passed the upper end of the Yevgijeh grove, and at 8 arrived at Khan Jideedah. Ali Pacha at Delli Abbas. All the bridges over the canals that I passed this morning being repaired, and made strong for passing the artillery. Delicious dates and water-melons here. Thermometer at 92 deg. at 3 P.M. Got angles from the top of the khan near sunset. The gilt domes of Kauthun in sight, bearing 196 deg. 30 min. by compass. The Kharlis ends about half a mile south from this.

Friday, September 13.—At 3.30 left the khan for Baghdad, after another restless night from the sand-flies. Several horsemen from the Pacha passed the khan during the night. He is expected here this evening.

From 4.15 to 5.15, lost our road in a large marsh occasioned by the last flood: a new road having been made nearer the Tigris. The wind rather cool this morning: found it rather chilly riding through the high grass of the marsh covered with last night's dew.

It was my intention to have rode to mound Sukran, a large tomb to the east, about four miles from the road, being a fixed point, to obtain some angles for fixing several of the villages on the southern part of the Kharlis and Toweileh; but having already lost an hour in the marsh, with nearly five hours' more ride to Baghdad, and every appearance of a hot day, I rode on, leaving a very desirable object not accomplished, as most of the latter part of my work depended upon it.

7.35 passed the end of the banks of an ancient canal on our left called Boobisham, said to be a branch of the Kartool, and which again branches off into two about three miles to the E.N.E. They end here —no sign whatever remaining of them to the westward.

5.55, passed the Rushdea lake to the right between us and the river. 6.30, passed a red mound of ruin, called Bedhron, close on our right.

Passed several mounds of ruins, said to have been forts erected by

* 4 morning, S by E.; 4.5 morning, south; 4.45 morning, S. by W.; 5 morning, S.W.; 5.8 morning, W.S.W.

† Blank in the original.

Thomas Khan on the Persian attempt to take Baghdad. The Naher Toweish was also cut by him to within a few miles of Kauthun.

At 10, arrived at the Moodhun gate of Baghdad. The sun getting very warm, rode down to the river, and went on board the steamer; nobody expecting me back so soon.

(Signed) H. W. GROUNDS, Lieutenant, I. N.
(Signed) H. B. LYNCH,
Commanding Euphrates Expedition.

METEOROLOGY OF FEROZEPOOR AND SUKKUR.

The following note of the meteorology of Ferozepoor and Sukkur has been supplied us by the relative of a talented Bengal officer, whose name is desired to be withheld, lately deceased. The sickness which proved fatal to him appears to have increased so much as to have caused the discontinuance of the record after the 6th of December. It is but a fragment that has been supplied, but it helps to fill up the blank in our knowledge of the natural history of the banks of the Sutlej :—

Date.	Range of Thermo.	PREVAILING WINDS AND STATE OF THE WEATHER.
	Deg. Deg.	CAMP, FEROZEPOOR, *January* 1843.
1	52 to 68	Westerly, light breeze. The rain, which commenced at 6 P.M. yesterday, continued heavy throughout the night, till about daybreak. To-day cloudy, with intervals of sunshine.
2	52 — 64	Northerly, light breeze. In the morning a heavy fog. Day clear and cold.
3	41 — 62	Nor.-westerly, do. do. slight fog. do.
4	41 — 62	Do. do. After 7 A.M. very heavy fog. Strong hoar frost. Day clear.
5	40 — 62	Do. do. Morning foggy. do. do.
6	40 — 62	Do. do. do. do. do.
7	39 (32†) 62	Do. do. Slight fog after sunrise. do. Hazy clouds.
8	40 (32†) 65	Sou.-easterly & variable, light breeze. do. do. Thin Haze.
9*	40 — 62	Northerly, light breeze. Heavy fog after sunrise. do. Day clear.
10*	40 — 64	Westerly, do. Light do. Hazy.
11*	42 — 64	N.-westerly, do. do.
12*	42 — 62	South-east to north-east, light breeze. Thick haze throughout.
13*	41 (30†) 60	North, fresh breeze. Clear. Cold day.
14*	37 — 61	Nor.-west, light do. do. do.
15*	40 — 61	Do. do. do. do.
16*	40 — 61	North. do. do. do.
17*	37 — 61	Nor.-west, do. do. do.
18	41 — 62	Do. (morning N.E.) light breeze. Partial clouds. Chilly cold.
19	42 — 64	Nor.-easterly, do. A heavy fog in the morning.
20	44 — 64	Nor.-westerly, do. Partial light clouds.
21	42 — 64	North, do. Morning. do. Day clear.
22	44 — 65	Do. fresh breeze. Dusty. do.
23	44 — 66	Do. light do. do. Sky overcast with thin clouds.
24	50 — 67	South-east, fresh breeze. Cloudy. Partial light showers in the morning.
25	60 — 70	Do. light airs. do. Sky overcast throughout.
26	57 — 68	Nor.-west, do. Partial clouds. A smart shower at daybreak.
27	47 — 67	Do. do. Clear pleasant weather.
28	41 — 67	Do. fresh breeze. do. Morning cold.
29	43 — 73	Easterly, light airs. Afternoon hazy and rather sultry.
30	48 — 73	Do. do. Thin haze throughout.
31	50 — 73	Do. do. Thick hazy clouds throughout.

* Strong hoar frost in the morning. † Outside the tent.

Date.	Range of Thermo.			PREVAILING WINDS AND STATE OF THE WEATHER.
	Deg.		Deg.	CAMP, FEROZEPOOR, *February* 1843.
1	46	to	73	Sou.-westerly, light airs. Morning foggy. During the day a slight haze.
2	46	—	73	Do. do. Partial light hazy clouds.
3	46	—	78	West, fresh breeze from 11 A.M. till 4 P.M., with much dust. Sky clear.
4	45	—	76	Do. light breeze. Clear.
5	47	—	76	East, fresh breeze with much dust. Sky clear.
6	50	—	78	Do. till 4 P.M., and then West, light. do.
7	50	—	74	Westerly, light breeze. Sky overcast with thin hazy clouds.
8	52	—	74	Easterly and variable, light breeze. Partial light clouds.
9	49	—	74	West and North-west, fresh breeze from noon till 4 P.M. Much dust. Sky clear.
10	48	—	76	Do. do. do. do. do. do.
11	48	—	78	Do. coming to Nor.-east in the afternoon, light airs. Slight haze.
12	52	—	80	Nor.-west, coming to East after sunset. do. do.
13	52	—	74	Do. light airs. Sky overcast with hazy clouds.
14	52	—	78	Easterly and variable, light breeze. Hazy, with clouds towards evening. After 11 P.M., strong east wind with showers.
15	58	—	64	East, strong breeze. Cloudy. Heavy showers, with hailstones, thunder, &c., from 3 till 6 P.M.
16	Rd. to house.			Westerly, light airs. Thin hazy clouds.
17	61	—	64	Do. do. do.
18	60	—	64	Do. do. Very slight haze.
19	60	—	64	Do. do. Afternoon cloudy, and after sunset wind easterly.
20	60	—	65	Northerly, do. Thin hazy clouds.
21	60	—	65	Nor.-west and north, light airs. After sunset easterly. Thin hazy clouds, thickening towards evening.
22	60	—	66	Do. do. do. do. do.
23	60	—	64	Northerly, light breeze. Cloudy and chilly throughout. Some spitting of rain about sunrise.
24	60	—	64	Northerly, light airs. Morning foggy.
25	60	—	65	Nor.-easterly, do. Thin hazy clouds, thickening towards sunset.
26	60	—	65	North and north-east, fresh breeze. Cloudy and gloomy all day. Slight spitting rain after sunset.
27	60	—	65	Easterly, strong breeze till sunset, then west. Cloudy throughout. Slight showers in the morning.
28	60	—	65	West and north-west, light breeze. Cloudy throughout.
				FEROZEPOOR, *March* 1843.
1	60	to	65	North-west, fresh breeze. Thick hazy weather. Wind came to east after sunset.
2	61	—	66	Do. coming to east after sunset. Thin hazy clouds.
3	61	—	65	Variable, north-east to north-west, light breeze. Sky overcast. Occasionally a few drops of rain.
4	61	—	65	North-west, fresh breeze. Morning foggy. Sky overcast throughout the day.
5	61	—	66	A.M. easterly, P.M. westerly, light. Partial clouds with sunshine.
6	62	—	68	Easterly, light. Do. do.
7	63	—	68	North-easterly, light. Hazy.
8	64	—	70	Do. do. do.
9	64	—	67	Do. fresh breeze. Cloudy, with thunder in the afternoon.
10	62	—	66	Do. do. do. A smart shower early this morning.
11	62	—	66	Do. do. do. throughout, with frequent showers.
12	60	—	64	Do. light breeze. do. Heavy showers during the forenoon.
13	60	—	66	Westerly, do. Clear. Pleasant weather. Morning foggy.
14	62	—	67	Do. do. Hazy clouds. do.
15	62	—	66	Variable, do. do. A squall from south-west about 8 P.M. Much dust.
16	63	—	68	Southerly and variable, fresh breeze. Hazy clouds.
17	64	—	70	Westerly, do Thin haze.
18	00	—	00	(Marched down to the Ghat and embarked for Sukkur.)
19	61	—	74	Northerly. Cloudy, with some light rain. Raw chilly weather.
20	61	—	74	North-west. Light hazy clouds. Pleasant weather.
21	64	—	78	Westerly, light breeze do. Rather sultry.
22	64	—	78	South-east, strong breeze. Heavy clouds. Morning showery.
23	64	—	76	Do. variable, do. do. About 8 P.M. a thunderstorm with hail and rain.
24	61	—	76	Westerly, light breeze. Partial clouds. Pleasant weather.
25	61	—	76	East and north-east, strong breeze from noon till 4 P.M. Partial light clouds.
26	58	—	75	Easterly, fresh breeze forenoon—after 3 P.M. calm.
27	62	—	77	Southerly, light airs. Clear pleasant weather. Sun getting powerful.
28	57	—	80	Easterly, do. do. Sun very powerful.
29	60	—	84	Westerly, do. do. do.
30	60	—	87	Do. light breeze. do. do.
31	62	—	88	North-east to west, strong breeze from 10 A.M. till 2.30 P.M. Sun very powerful

Date.	Range of Thermo.	PREVAILING WINDS AND STATE OF THE WEATHER.
	Deg. Deg.	SUKKUR, *April* 1843.
1	64 to 90	South-west and westerly, light airs. Slight haze. Sun very powerful.
2	64 — 88	Do. do. do. do. do.
3	64 — 93	Westerly, light airs. Morning hazy. do.
4	68 — 90	Southerly, do. Clear. do.
5	70 — 95	Do. fresh till about 1 hour after sunrise, then west, light. do.
6	71 — 98	Do. fresh breeze from noon till 3 o'clock. do.
7	71 — 94	Do. and variable, light. do.
8	71 — 101	Westerly, do. (Moved out of boat this evening.) do. (IN CAMP—In Tent at Sukkur, near bank of the Indus.)
9	71 — 103	Northerly, strong breeze. do.
10	71 — 103	North-westerly and variable, light breeze. Thin haze. do.
11	71 — 108	South-easterly, light airs. Sultry. do. do.
12	74 — 110	South-westerly, strong breeze. do. do.
13	72 — 97	Do. do. Partial clouds. do.
14	72 — 97	North-west, light breeze. Clear. do.
15	70 — 98	A.M. east, fresh breeze—P.M. north, light. Clear. do.
16	70 — 100	Do. strong do. do. do. Hazy clouds do.
17	70 — 102	Morning south-east—day northerly, light breeze. Hazy clouds, do.
18	73 — 102	Variable, light. Thin haze. do.
19	73 — 105	Northerly, do. Clear. do.
20	73 — 110	Do. and variable, light. Clear. do.
21	72 — 94	North-west, strong breeze. do. Much dust. Evening hazy. do.
22	73 — 102	Round the compass—at times fresh, at others light. Hazy. From 2 till 4 P.M. sultry, with distant thunder.
23	73 — 104	A.M. easterly—P.M. westerly, light breeze. Hazy. Near 8 P.M. a north-west squall, with rain, &c.
24	74 — 105	Day variable—night strong breeze throughout from N.E. to N.W., with much dust.
25	74 — 102	Northerly and westerly, light breeze.
26	76 — 103	Do. light airs. Hazy and rather sultry.
27	76 — 107	South-west and variable, light breeze. Hazy and sultry. Very powerful sun.
28	76 — 106	Do. to north-west—A.M. do.—P.M. fresh breeze. Hazy. do.
29	74 — 98	Westerly, fresh breeze. Clear.
30	76 — 108	Easterly, light breeze—P.M. calm. Light haze, with very powerful sun.
		CAMP, SUKKUR, *May* 1843.
1	74 to 107	North-east to north-west, light airs. Light haze, with powerful sun.
2	74 — 110	North to north-west, wind hot, light breeze, do. do.
3	76 — 112	S.-west, forenoon light breeze—after 3 P.M. nearly calm. Clear with strong sun.
4	78 — 113	do. and variable, do. do. do.
5	80 — 110	A.M. north-east, fresh breeze—after 2. P.M. nearly calm. Strong winds with much dust for some time before daybreak this morning.
6	80 — 111	Northerly, light airs. Clear, with very powerful sun.
7	78 — 104	North-east, fresh breeze. Partial clouds. do.
8	78 — 106	Northerly, light breeze—after sunset, easterly, light breeze. Hazy. do.
9	76 — 108	Do. and variable, light airs. Last night a strong breeze from E. Hazy.
10	76 — 103	North-east till noon, strong breeze, then light. do.
11	74 — 108	Do. fresh breeze 8 A.M. till noon, then light. Slight haze.
12	76 — 110	Do. light airs. do. Very strong sun.
13	78 — 109	Northerly, do. Thin hazy clouds. Very powerful sun.
14	78, 108, 76	Do. till 3 P.M., light airs. Hazy clouds and sultry. From 3 till 7 P.M. a storm from south-east with rain.
15	76 — 100	South-east, light. Hazy clouds. Afternoon close.
16	78 — 108	Variable, do. Thin haze with powerful sun.
17	78 — 100	Northerly, fresh breeze till 3 P.M., then light. Thin haze. Strong sun.
18	76 — 109	Do. do. till 10 A.M., southerly. Clear. do.
19	80 — 112	Do. light airs. Hazy and sultry. do.
20	78 — 104	Do. light breeze. Clear. do.
21	76 — 109	Do. evening north-east, fresh breeze. Clear. do.
22	80 — 111	Do. A.M. fresh breeze—P.M. light do. do.
23	80 — 107	Do. fresh breeze till 3 P.M., then light. do. do.
24	75 — 110	North-east, and after sunset south-east, light breeze. Clear. do.
25	82 — 114	Do. light airs and calms. do. do.
26	77 — 118	South-west and variable, light. do. do.
27	80 — 121	Northerly and variable, do. Thin hazy clouds. do.
28	80 — 120	Northerly and west, light breeze. Clear. Wind hot. do.
29	84 — 120	A.M. do. do. evening south-west, fresh breeze. Clear. Wind hot. do.
30	84 — 122	South-west, fresh breeze, except from noon till 4 P.M. do. do. Intense heat.
31	86 — 120	Do. light, and from noon till 3 P.M. calm—after 9 P.M. squally, with much dust.

Date.	Range of Thermo.		PREVAILING WINDS AND STATE OF THE WEATHER.
	Deg.	Deg.	CAMP, SUKKUR, *June* 1843.
1	86 to	114	South-west, fresh breeze. Hottish afternoon. Clear, with powerful sun.
2	86 —	113	Do. do. do. do. do.
3	79 —	108	Westerley, do. do. (morn. and even. cool and pleasant) do.
4	76 —	108	Do. strong breeze, rather dusty. do. do. do.
5	77 —	110	North-westerly, fresh breeze. do. do. do.
6	78 —	110	Do. and variable, light do. do. do. do.
7	80 —	88	(IN HOUSE.) Variable, light airs. do. do. do.
8	84 —	89	Do. do. do. even. a sort of muggy warmth.
9	85 —	91	Do. do. Thin hazy clouds. Sultry.
10	86 —	92	Do. do. do. do. [light hazy clouds.
11	86 —	92	Southerly, day, light airs—night, fresh breeze. Day clear. Towards evening
12	86 —	92	South-west and variable—day nearly calm—night, light breeze. do. do.
13	86 —	92	Southerly do. do. Clear W. very powerful sun.
14	86 —	93	Northerly and north-easterly, do. do. Day clear, even. thin hazy clouds.
15	88 —	93	South-westerly, light breeze.
16	88 —	94	Westerly, fresh breeze. Hottish from 11 A.M. till 5 P.M. Clear. Strong sun.
17	88 —	94	Do. and south-westerly, light breeze. Clear, with powerful sun.
18	89 —	94	Easterly and variable, light airs. Slight haze. do. [midnight.
19	89 —	94	Southerly, light airs during the day—after sunset light breeze and warm till
20	87 —	95	Do. fresh breeze till about 2 P.M., then light airs. Dusty haze. Very strong sun.
21	86 —	95	Do. strong breeze all last night and this forenoon. Thick do. do.
22	86 —	95	Do. fresh breeze forenoon, afternoon light or calm. Dusty do. do.
23	85 —	94	S.-east and south, light breeze. do. nearly calm. Pretty clear. do.
24	85 —	94	Southerly, do. do. do. do.
25	85 —	94	Do. do. do. do.
26	85 —	94	Do. light breeze. (Strong br. last night.) P.M. calm. do. do.
27	86 —	94	Do. do. do. Thin hazy clouds. do.
28	86 —	93	S.-easterly, do. do. Pretty clear. do.
29	86 —	93	Southerly, do. do. Clear. do.
30	86 —	94	S.-E. & Sy., do. do. do. do.

N.B.—The above register, since the 7th, kept in a small house usually shut up about two hours after sunrise: no tatties, &c., used. Throughout the month there has been no steady breeze during the day, and that such as would not be called a regular hot wind. Latterly a fresh breeze has regularly sprung up after sunset, continuing warmish till about midnight—the mornings cool and pleasant.

				SUKKUR, *July* 1843.
1	85 to	93	South-east and south—light breeze—day. From sunset till sunrise, past night, strong southerly breeze. Sky clear, with powerful sun.
2	85 —	93	Do. do. do. do. as above.
3	86 —	93	Do. do. Light airs. Some thin hazy clouds. Past night, calm or light easterly winds.
4	87 —	94	Do. do. do. Past night light S.E. winds.
5	87 —	94	Do. do. do. (Fresh breeze before daybreak till about 7 A.M.) thin hazy clouds. [light breeze.
6	88 —	94½	Do. do. do. Thin hazy clouds. Daybreak till 8 A.M.
7	89 —	95	North-east and variable. do. do. A strong S.E. wind past night, from 11 P.M. till daybreak. [4 P.M., much dust.
8	89 —	95	Easterly and variable. do. Sultry, do. A strong N.Wr. at
9	88 —	95	Var. Lt. airs. Thin hazy clouds (sky overcast.) Past night very close and
10	89 —	95	Do. do. do. do. [sultry.
11	88 —	95	Do. do. do. do.
12	86 —	95	South to south-west. Light breeze. Partial hazy clouds.
13	88 —	95	Variable light airs. Thin hazy clouds. Sultry oppressive heat.
14	89 —	94	Do. do. Sultry do. Clouds collect after nightfall, with thunder, &c., and after 10 P.M. there was a good fall of rain.
15	86 —	94	S.E. to S.W. Light. Thin hazy clouds and sultry. [hazy clouds. Sultry.
16	86 —	93	Sly. and var. Morn. light breeze. After 9 A.M. light airs and calms. Thin
17	86 —	93	Do. do. Light airs. Thin hazy clouds. Sultry. [Very strong sun.
18	87 —	93	Do. do. Morning light br. Day calm. Some very thick hazy clouds.
19	87 —	93	Do. and easterly. do. do. do. do. [sun.
20	87 —	93	Do. do. Light do. do. Thin hazy clouds with strong
21	84 —	92	Easterly and variable. Light breeze. Cloudy, with moderate rain for about an hour in the morning.
22	84 —	92	Easterly and variable. do. A heavy fall of rain past night. Monsoon-like. Light rain again from sunset till late in the night. [sunrise.
23	83 —	91	N.-Ely. Fresh breeze. Cly. throughout. Light rain for about an hour at
24	84 —	90	Do. do. do. Do. morning and evening.
25	83 —	88	Do. to S.E. Light do. do. Light passing showers.
26	83 —	88	Do. Fresh breeze. do.
27	83 —	89	Easterly. Light airs. Partial clouds. Powerful sun.
28	83 —	89	S.E. Light br. Day clear, with strong sun. Towards evening light clouds.
29	84 —	90	E. to N.E. Light do. do.
30	85 —	90	E. (Morning var.) Light do. do.
31	85 —	90	Do. do. do. Hazy. do.

Date.	Range of Thermo.		PREVAILING WINDS AND STATE OF THE WEATHER.
	Deg.	Deg.	SUKKUR, *August* 1843.
1	86 to	90	North-east. Fresh breeze. Thin haze, with powerful sun.
2	87 —	93	Do. do. do. do. Past night close and sultry
3	88 —	92	Ely. and sly. do. do. After dark a strong southerly breeze.
4	87 —	92	Southerly. do. do. After sunset do. south-easterly do.
5	86 —	92	S.-easterly. Light breeze. do. do. do.
6	86 —	91	Do. Light airs. do. do. Southerly do.
7	85 —	90	Southerly. do. Clear after 9 P.M. do. do. do.
8	85 —	90	Easterly. do. do. do. do. do.
9	86 —	90	Do. do. do. do. Light do. do.
10	86 —	90	Do. and N.E. do. do. do. do. do.
11	86 —	90	Easterly. do. Thin clouds. do. do. do.
12	86 —	90	Sly. and var. do. Slight haze. do. do. do.
13	86 —	90	Ely. do. do. Clear. do. do. do.
14	84 —	90	Do. do. do. After sunset strong southerly breeze.
15	85 —	90	E. and S.E. Light br. do. do. do. do.
16	85 —	90	Do. and var. do. do. After 9 P.M. light southerly breeze.
17	85 —	90	Easterly. do. do. do. do.
18	85 —	90	Southerly. do. do. do. do.
19	86 —	91	Ely. and var. do. Light clouds. Sultry.
20	87 —	91½	Do. do. do. do. do.
21	88 —	94	N.E. Fresh br. after 10 A.M. (Morning close and sultry.) Thin hazy clouds.
22	89 —	92	Do. do. do. do. do.
23	89 —	92	Ely. Light do. do. do. do.
24	89 —	92½	Do. do. do. do. do. do.
25	89 —	92½	Do. do do. do. do. do.
26	92 —	95	N.E. Fresh breeze after 10 A.M. Morning and past night close and sultry.
27	90 —	94	East. do. do. do.
28	88 —	93	Sly. and S.E. do. Light hazy clouds. After 9 P.M. strong Sly. br.
29	89 —	92	Do. do. Light do. do. light do.
30	86 —	90	Do. and var. do. Partial clouds.
31	86 —	90	Do. do. do. do.

				SUKKUR, *September* 1843.
1	86 to	90	Southerly. Light airs. Thin hazy clouds.	
2	87 —	91	Ely. and var. do. do. Sultry. A heavy N.E. squall, with much dust and a few drops of rain, about 5 P.M.	
3	88 —	92	Ely. and var. Light airs. Thin hazy clouds. Sultry. A slight squall as above; no rain.	
4	86 —	92	Do. do. do. do. do. During the night a light breeze from the southward.	
5	86 —	92	Westerly. Light airs. Thin hazy clouds. Sultry. do.	do.
6	86 —	92	S.-Wly. do. do. do. do.	do.
7	86 —	92	N.E. Light breeze. do. do.	do.
8	86 —	92	Do. and var. Light airs and calm. Clear. Sultry heat. do.	do.
9	84 —	91	Do. do. do. do.	do.
10	84 —	90	Do. do. do. do.	do.
11	84 —	90	South-easterly. do. do. do.	do. strong Sly. br.
12	82 —	89	East and S.E. do. Powerful sun. do.	do.
13	82 —	89	South-east. Light breeze. do.	do.
14	78 —	88	Do. Light airs. Morning cold. do.	fresh do.
15	80 —	87	Southerly. Light breeze. Cool. do.	light do.
16	79 —	87	Do. and var. Light airs. do. do.	do.
17	79 —	87	Do. do. do. do. do.	do.
18	79 —	87	Do. do. do. do. do.	do.
19	79 —	87	Do. and Ely. do. do. do.	do.
20	78 —	86	Do. do. do. do. do.	do.
21	79 —	87	Do. do. Light breeze. do. do.	do.
22	80 —	88	Do. do. Light airs. Thin hazy clouds. do.	Night calm.
23	82 —	88	Do. morning. Day calm. Do. with intense sun.	do.
24	82 —	88	S.E. and variable. Light breeze. do.	
25	82 —	88	Do. do. do. do.	
26	78 —	87	N.E. (Morning. Sly.) do. Clear.	
27	78 —	87	Easterly. do. do.	
28	78 —	87	Do. Light airs. Partial light clouds.	
29	80 —	87	S.-Ely. do. Clear.	
30	80 —	87	Easterly. do. do.	

Date.	Range of Thermo.			PREVAILING WINDS AND STATE OF THE WEATHER.
	Deg.		Deg.	SUKKUR, *October* 1843.
1	82	to	88	Ely. Light br. Clear, but a few light clouds afternoon. Night quite clear.
2	82	—	88	Do. do. do. do. do.
3	82	—	88	Do. Light airs. With light and scattered clouds. do.
4	82	—	88	Do. do. do. do.
5	80	—	87	Sly. do. do. do.
6	82	—	87	N.-Ely. do. Clear sky.
7	78	—	86	Do. do. do.
8	80	—	86	Do. do. do.
9	77	—	86	Do. do. do.
10	78	—	86	Do. do. do.
11	78	—	86	Do. do. do.
12	79	—	86	A.M. Ely., P.M. Wly. Light airs. Some very slight haze.
13	78	—	84	Southerly. Light breeze. Clear sky.
14	78	—	84	(Morn.) Sly. (day) Ely. Light breeze. Clear sky.
15	76	—	84	E. to N.E. Light airs. (Day) clear sky, (even.) hazy. Night again clear.
16	78	—	84	A.M. Wly., P.M. Sly. do. do. do. do. do.
17	78	—	84	Sly. and var. do. Afternoon cloudy. A heavy shower between 9 and 10 P.M.
18	78	—	84	A.M. Ely., P.M. S.W. and var. Light airs. Forenoon, light clouds. Afternoon clear.
19	76	—	82	South-easterly. Light airs. Sky clear.
20	76	—	82	Do. do. do.
21	76	—	82	Easterly. do. do.
22	76	—	82	Do. do. do.
23	76	—	84	N.-Easterly. Light breeze. do. [In Fort Bukkur with doors open during the day.]
24	74	—	84	Wly. and var. do. do. do.
25	74	—	84	Variable. Light airs. do.
26	72	—	84	Morn. E., fresh br., afterwards light and var. Sky clear. do.
27	72	—	86	Do. do. light—P.M. Wly.—dry breeze. do. do.
28	71	—	84	Do. do. do. Day var. Light airs. do. do.
29	72	—	84	Do. do. lt. br. do. do. Light breeze. do. do.
30	68	—	80	N.E. Morn. fresh br. Day light airs. do. [Cant., doors shut during day.]
31	70	—	81	Do. do. do. do. do. do.
				SUKKUR, *November* 1843.
1	70	to	80	North-easterly. Light airs. Sky clear and pure.
2	72	—	81	South west. Do. Day clear—evening, slight haze near the horizon.
3	73	—	82	Variable. Do. do. do. do.
4	70	—	81	Northerly. Light breeze. Clear sky. Morning cold and chilly.
5	70	—	79	Morn. E. frh. br.—day, N. light. Do., except a very thin haze near the horizon.
6	68	—	76	Do. do. do. do. Fresh br. till noon, then light. Thin hazy clouds.
7	70	—	76½	E. and N.-Ely. Morning light breeze—day, light airs. Clear.
8	71	—	77	Do. do. Light. Day, clear.—evening light haze.
9	71	—	78	South-Westerly. Light breeze. Thin hazy clouds throughout.
10	72	—	79	Southerly. Light airs. do. do. Thickening towards evening.
11	73	—	80	Southerly. Light airs. Thick haze throughout.
12	73	—	80	Do. do. Hazy. do.
13	72	—	82	Do. do. do. [Fort Bukkur with doors open.]
14	71	—	83	Do. do. Thick haze throughout. do.
15	72	—	82	Do. do. do. do. do.
16	72	—	81	Nly. and var. do. Thin haze. do.
17	68	—	80	Morn. do.—afternoon west, light breeze. A few light clouds. Morn. chilly.
18	67	—	80	Northerly. Light airs. Clear.
19	65	—	76	East. Fresh breeze. Cloudy throughout. Cold and chilly.
20	65	—	74	Do. do do. do. with light rain. Cold and chilly.
21	65	—	74	Do. Light do. Clear.
22	66	—	75	S.E. do. do.
23	66	—	76	Do. do. do.
24	67	—	76	Do. do. Thin haze.
25	67	—	76	Do. do. do.
26	67	—	76	Do. do. do.
27	67	—	76	Do. do. Clear.
28	61	—	74	East. A.M. fresh breeze—P.M. light airs. Sky clear.
29	65	—	76	Variable. Light airs. do.
30	65	—	74	East. Morn. light breeze—day, light airs. do.

Date.	Range of Thermo.	PREVAILING WINDS AND STATE OF THE WEATHER.			
					SUKKUR, *December* 1843.
	Deg. Deg.				
1	62 to 74	East.	Morn. fresh br.—day, light airs.		Partial hazy clouds.
2	63 — 73	Do.	do.	do.	do.
3	63 — 73	Do.	Light.		Clear.
4	63 — 72	Do.	do.		do.
5	62 — 72	Do.	do.		do.
6	60 — 70	Do.	do.		do.

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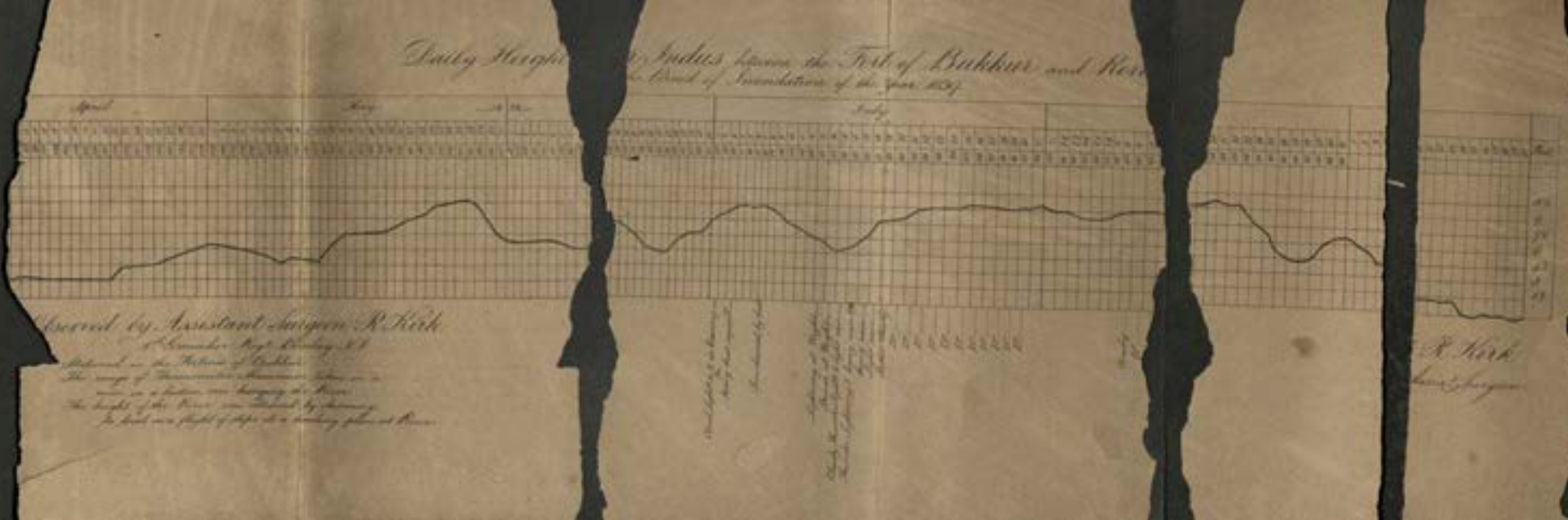

TIDE CURVES from the 21st NOVEMBER to the

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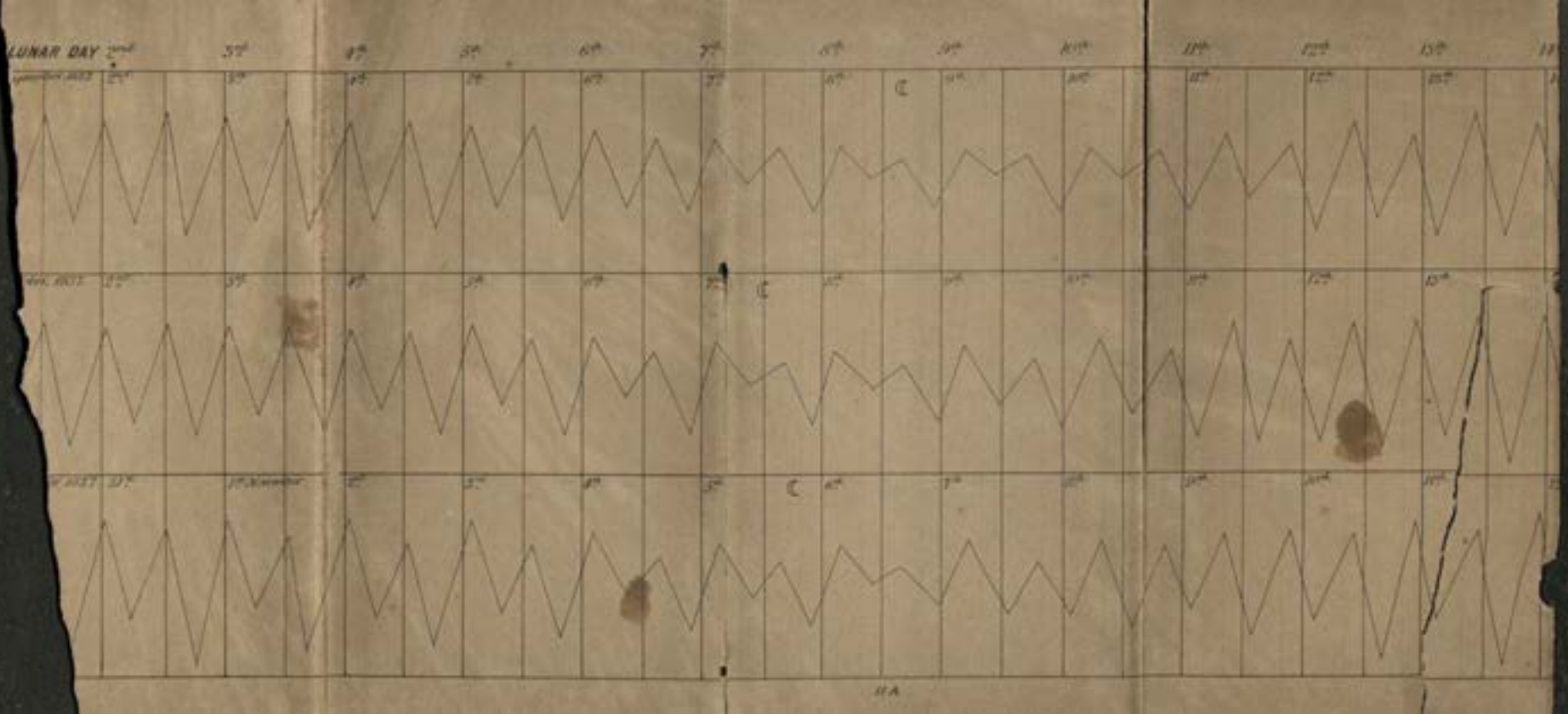
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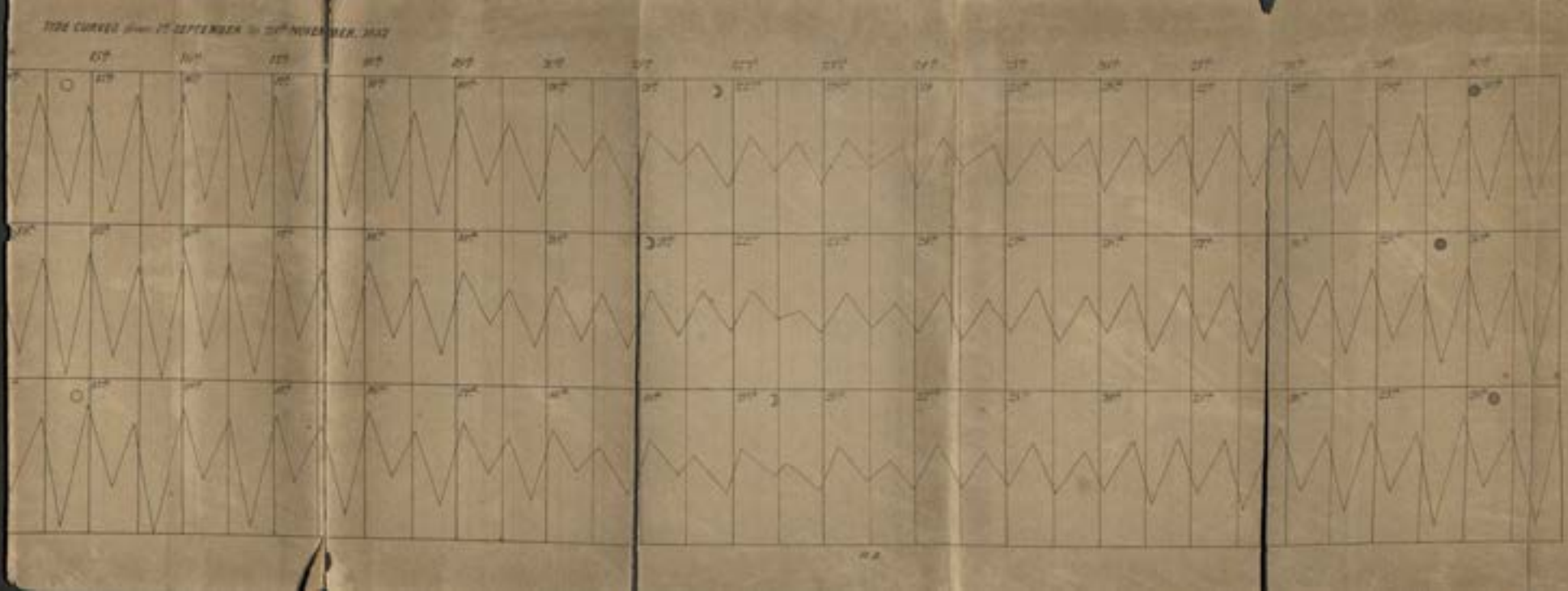
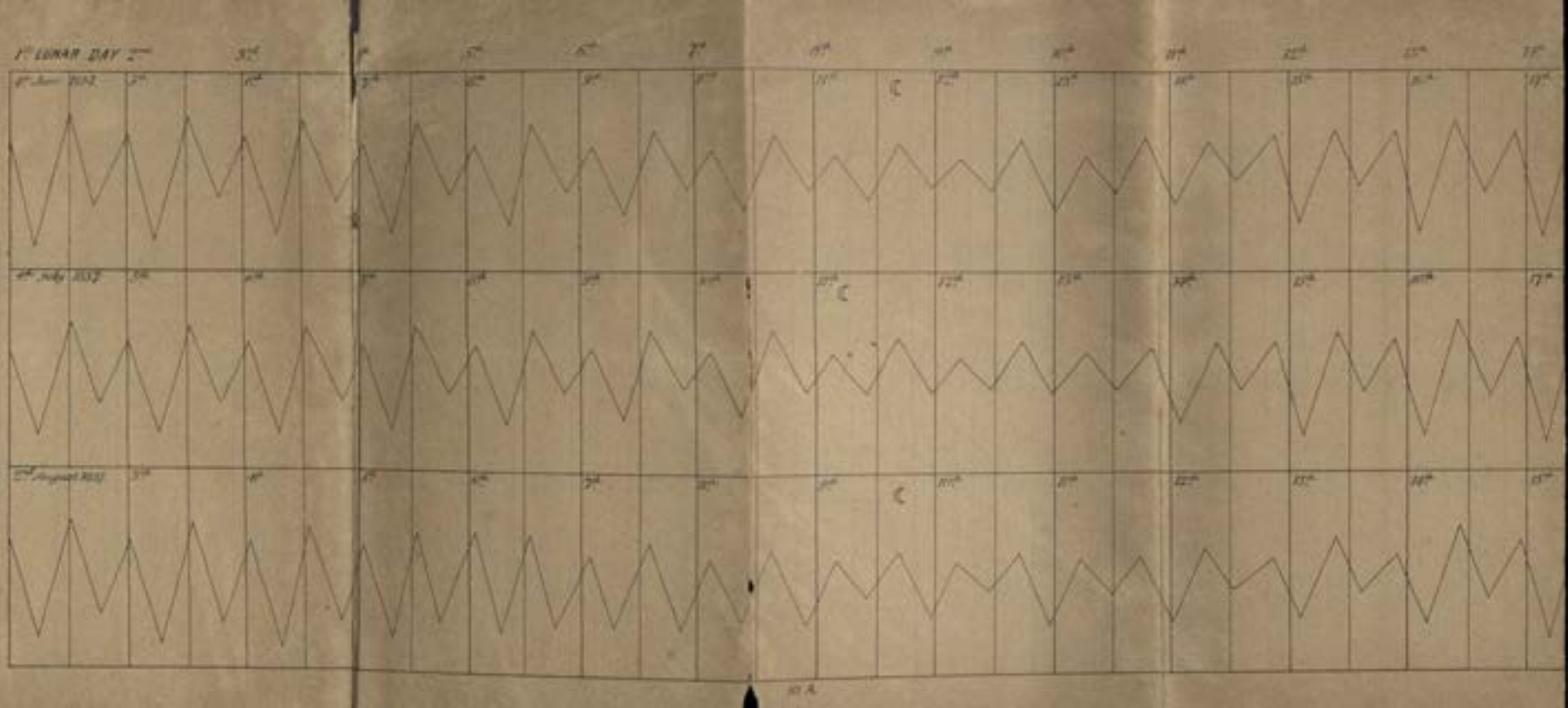
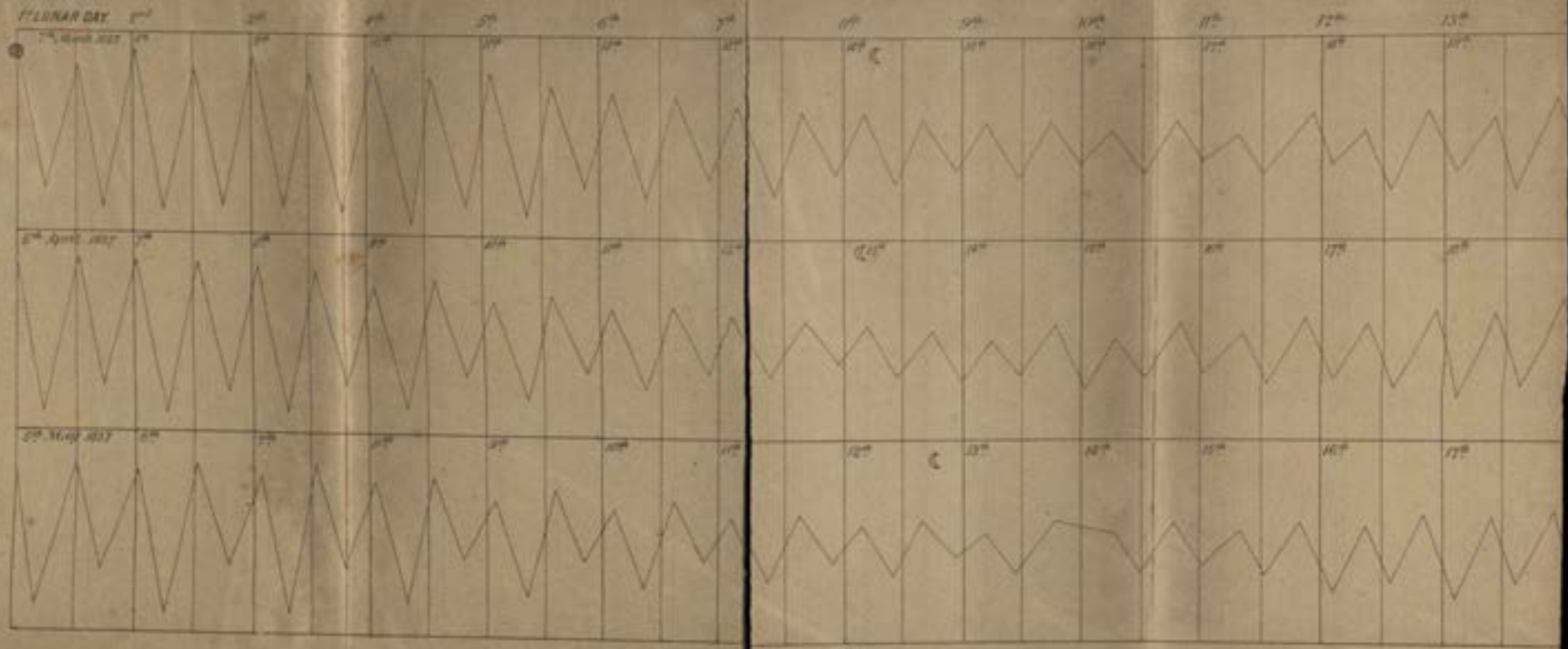




TIDE CURVES from the 4th JUNE to 31st AUGUST 1932.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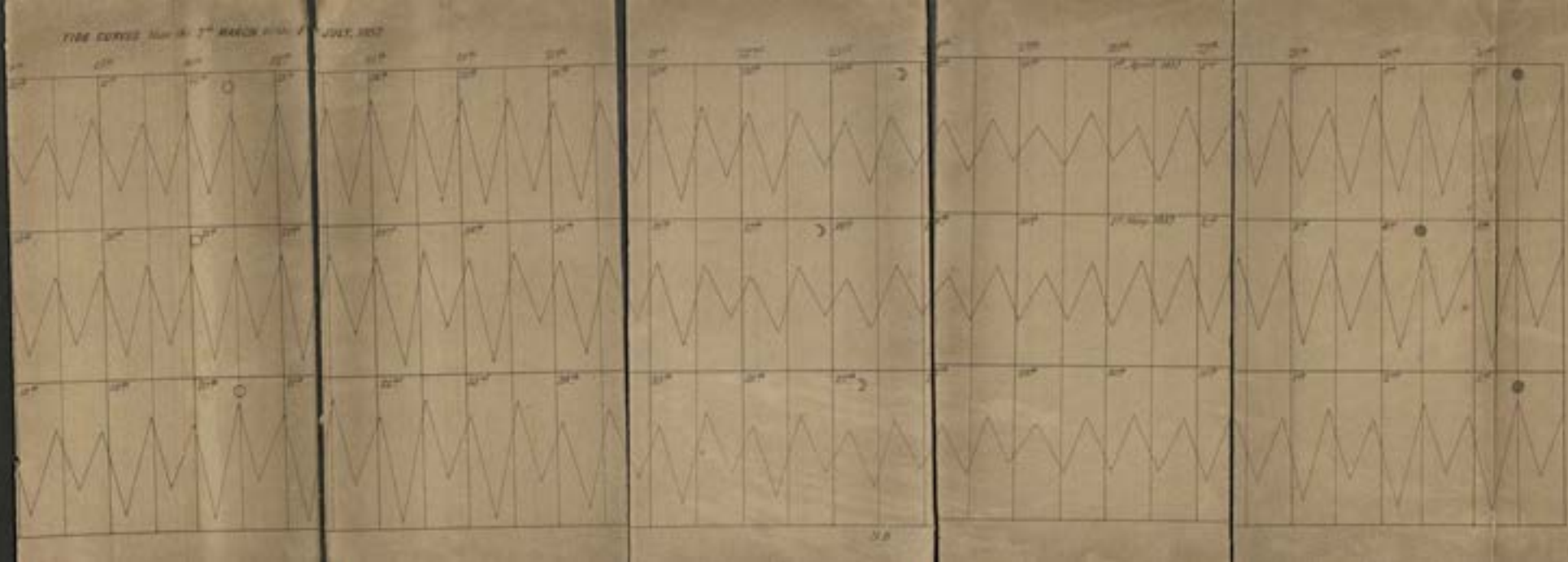

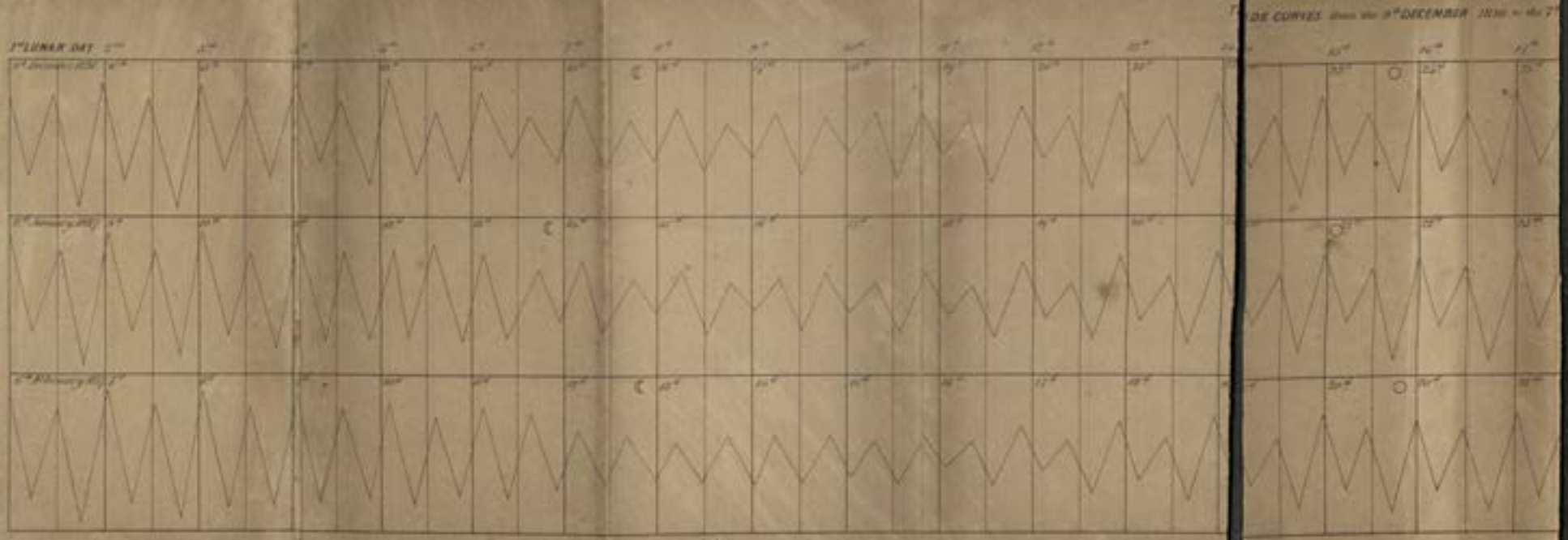
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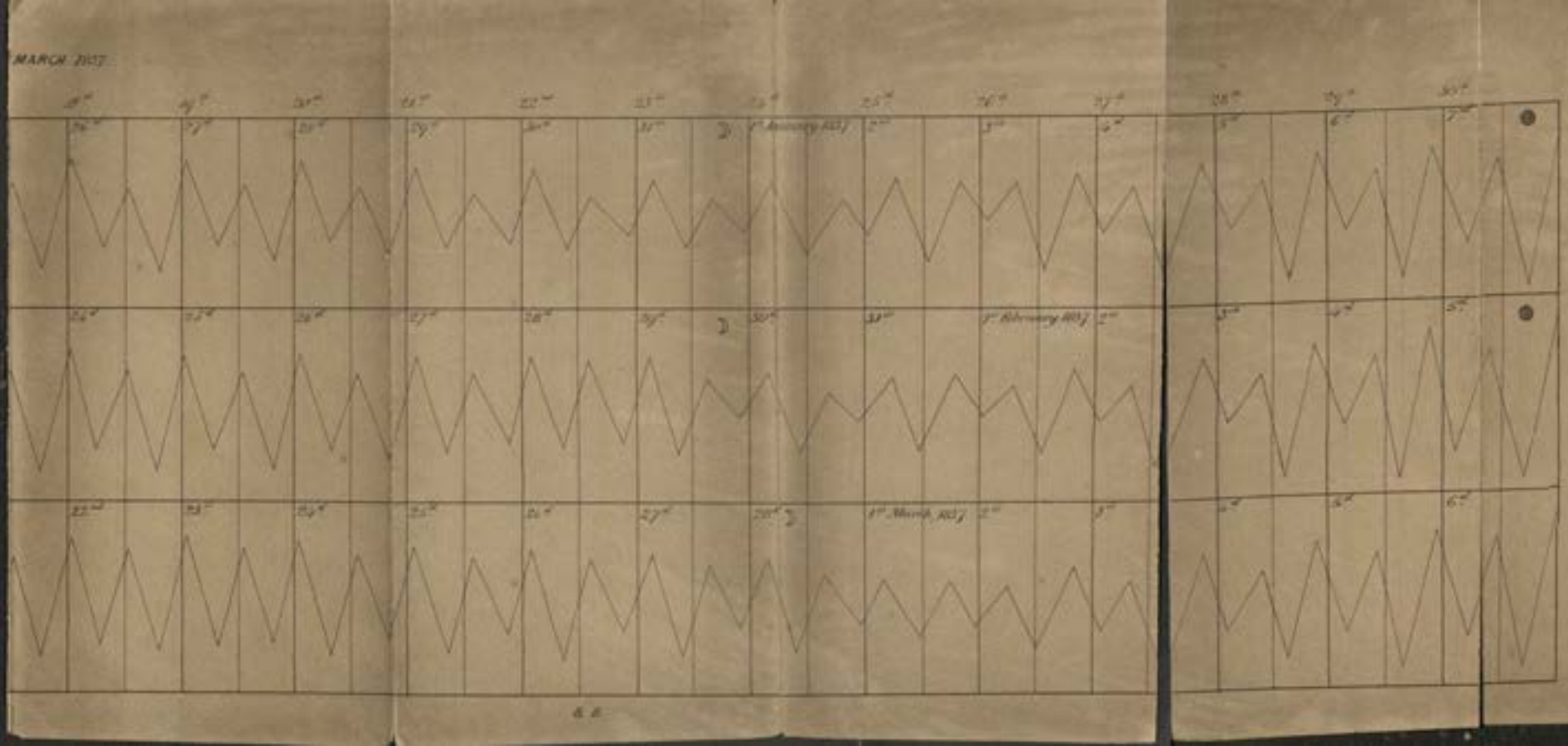
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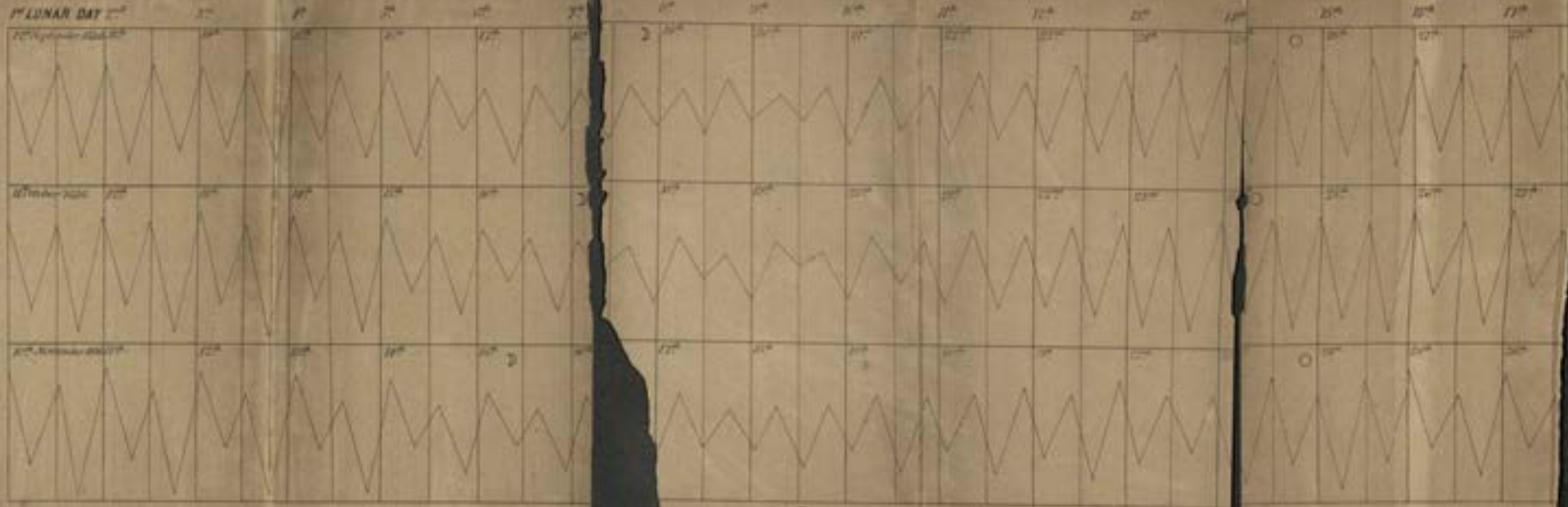
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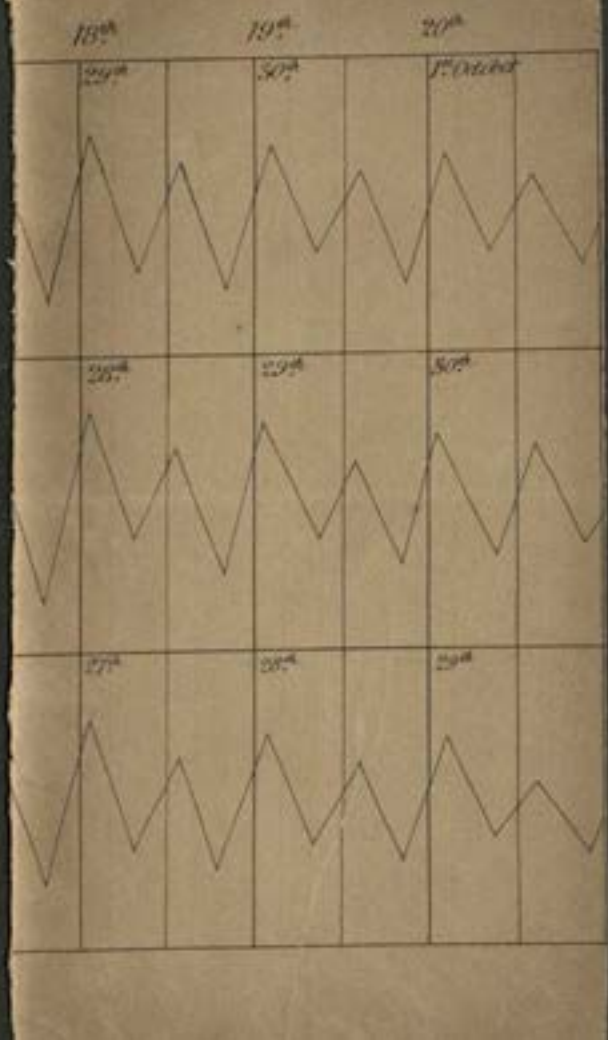
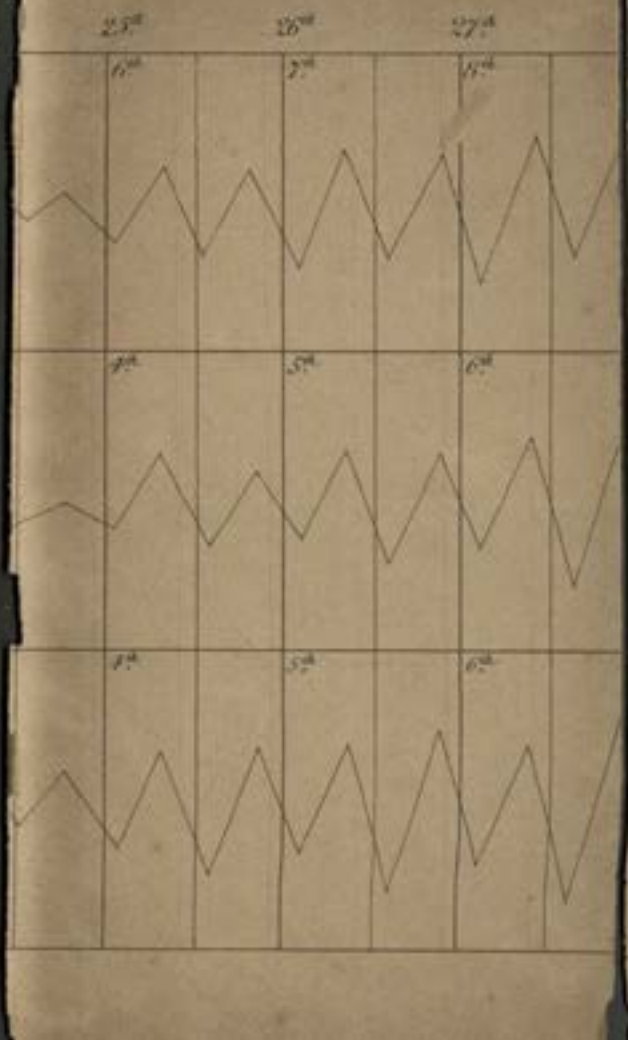
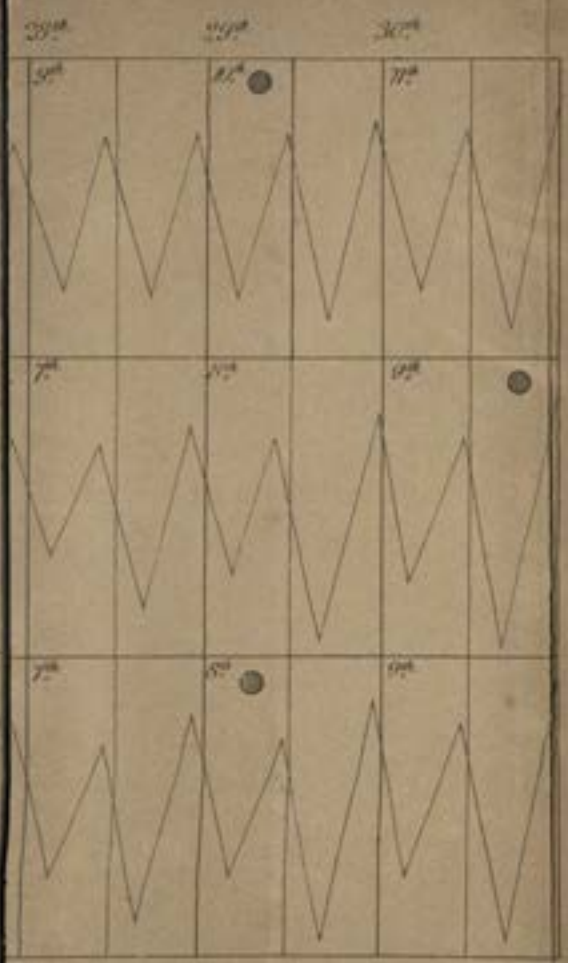
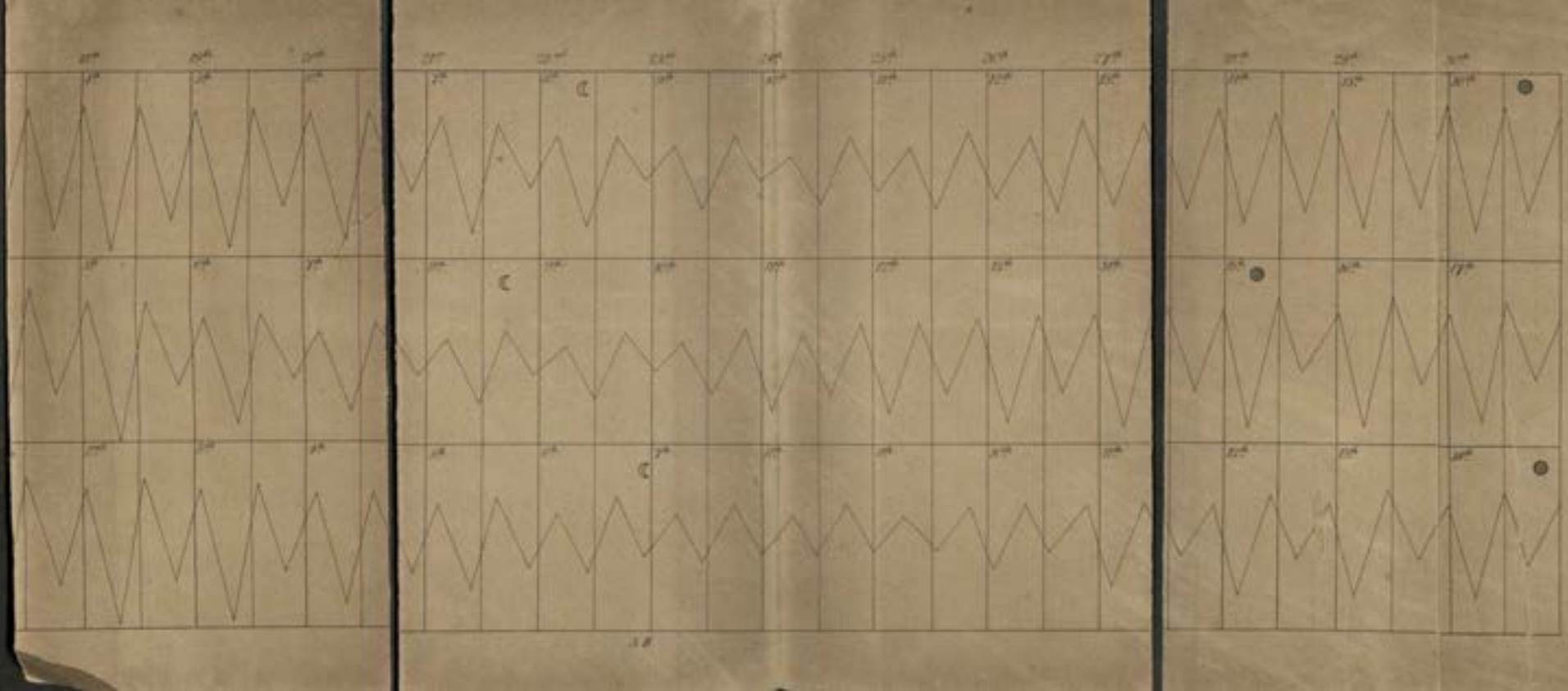
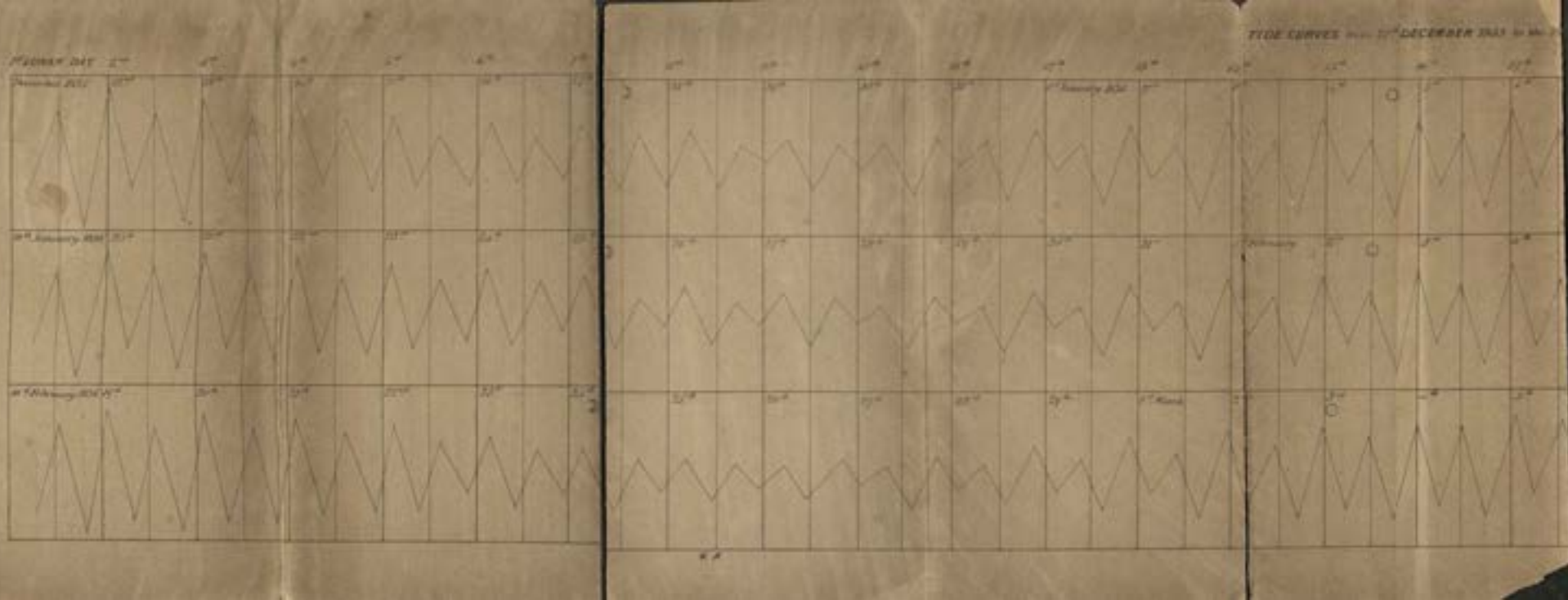
DECEMBER, 1856.

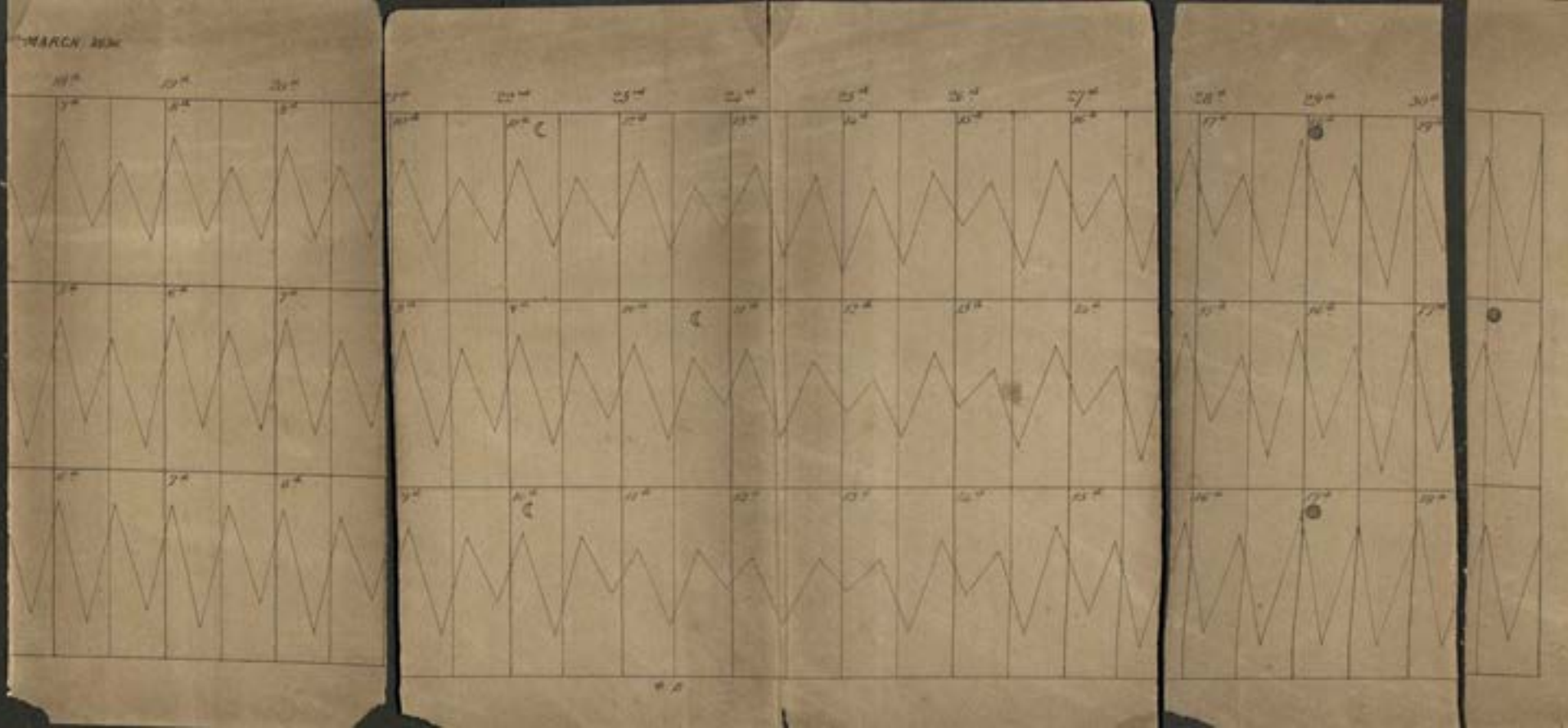


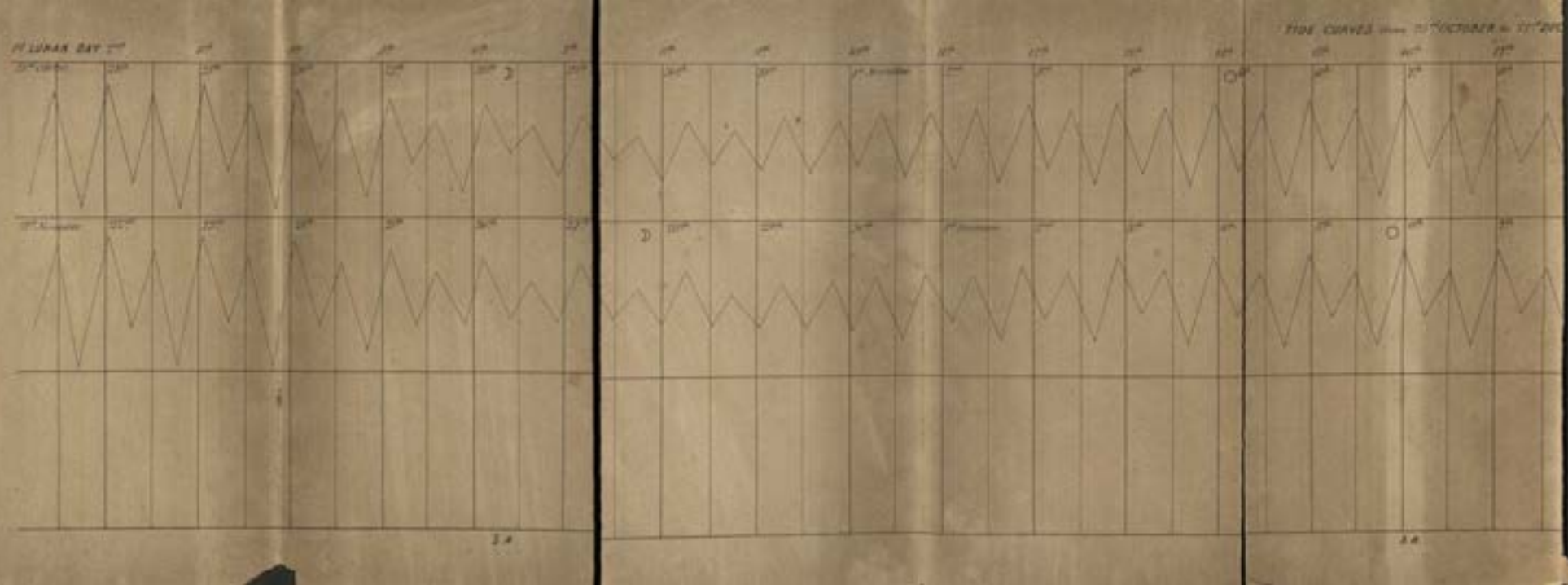


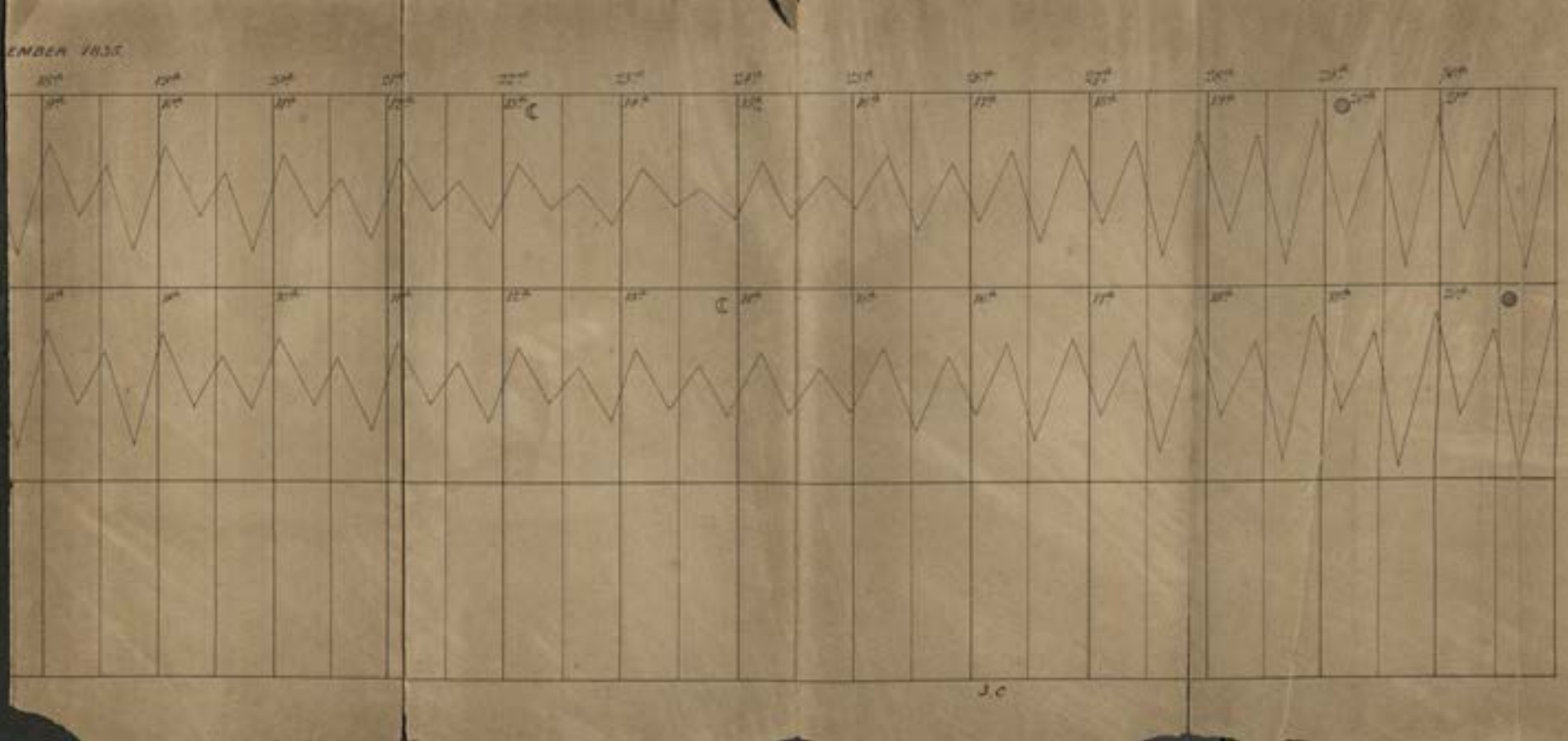








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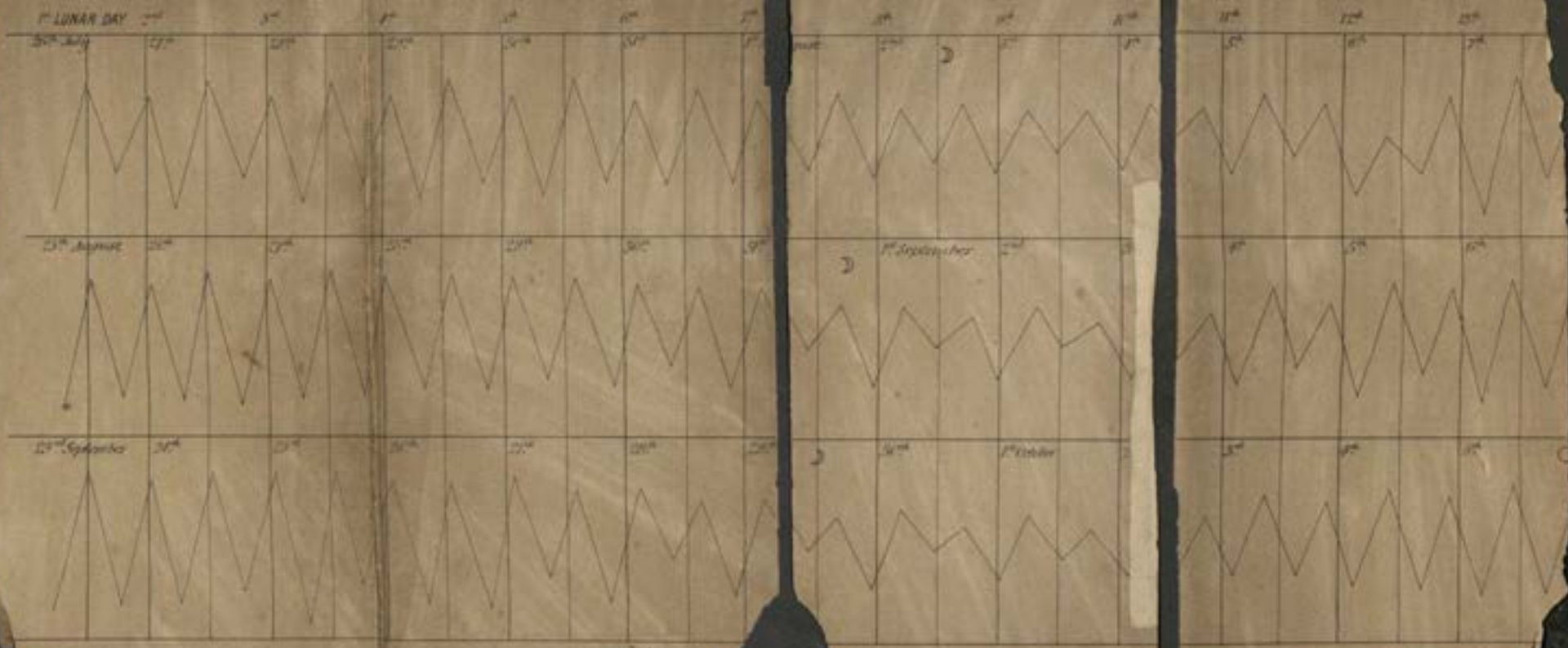

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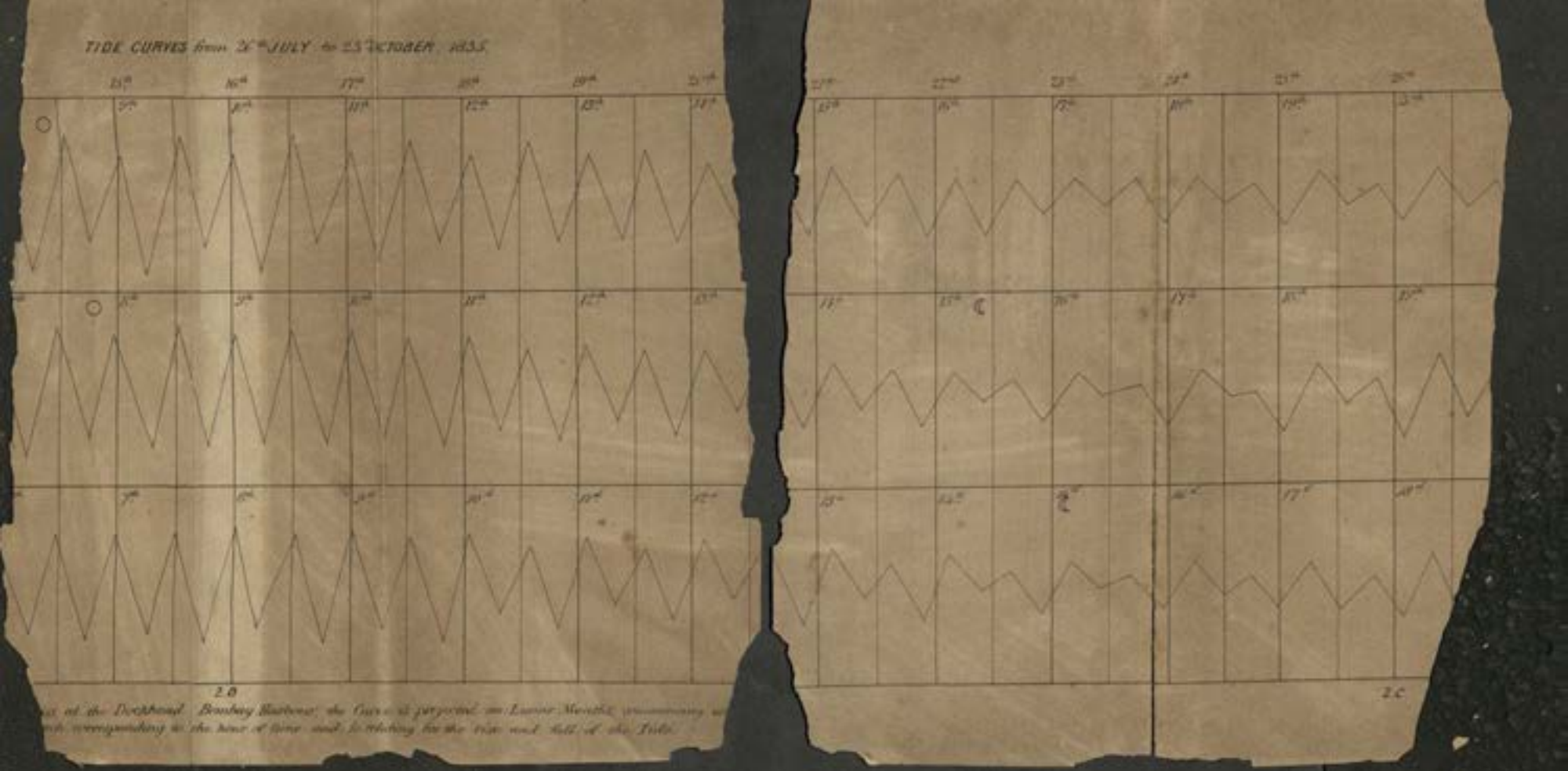
REAL OBSERVATIONS made under the direction
the Midnight, next New Moon. - The Sun


TIDE CURVES from 26th JULY to 25th OCTOBER 1835
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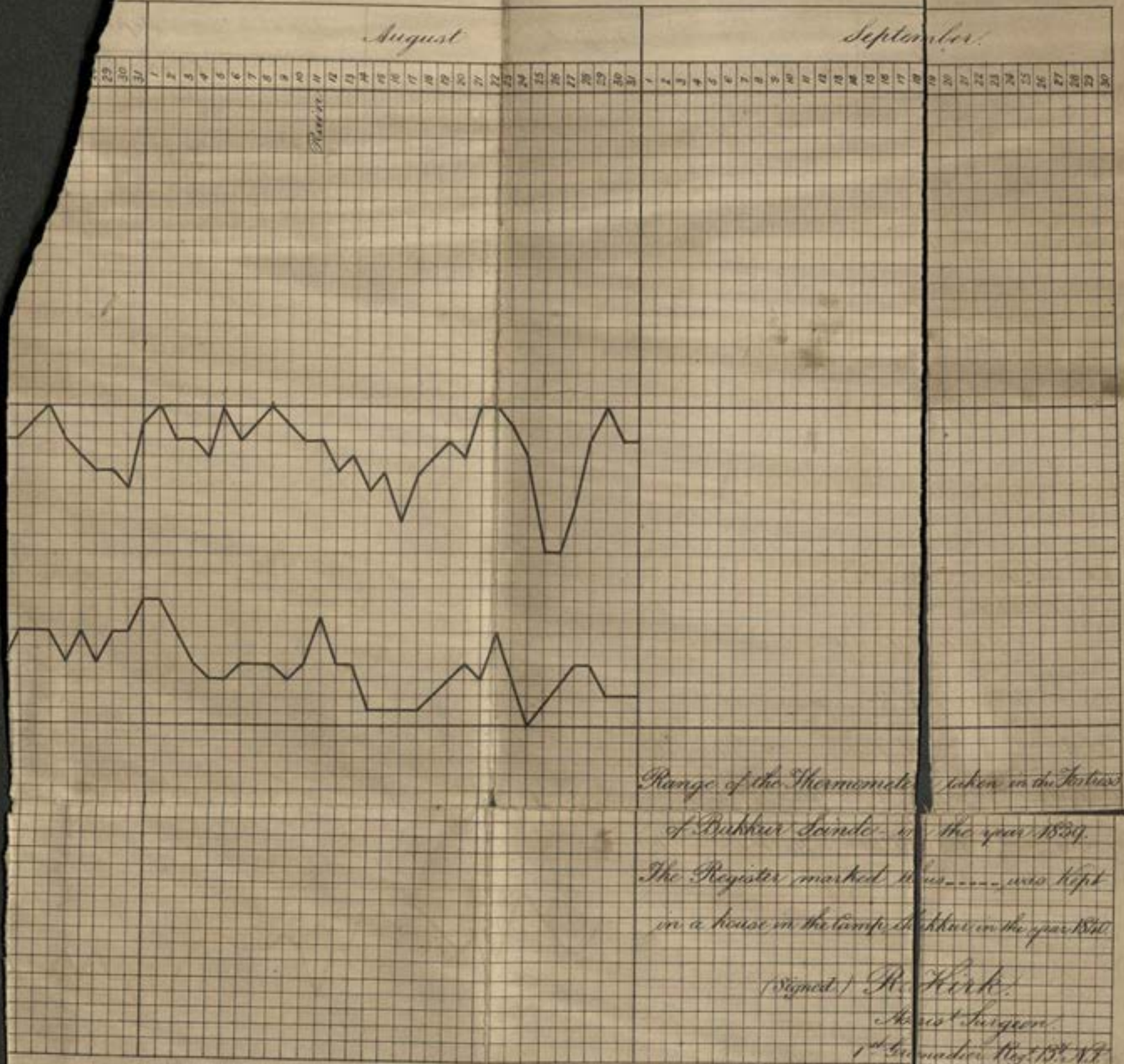

Range of the Thermometer taken in the Fortress of Bukkur Sinde in the year 1839.

The Register marked A was kept in a house in the Camp at Bukkur in the year 1840.

(Signed) R. Kirk.
Assist Surgeon
1st Grenadiers Regt 15th N.I.

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